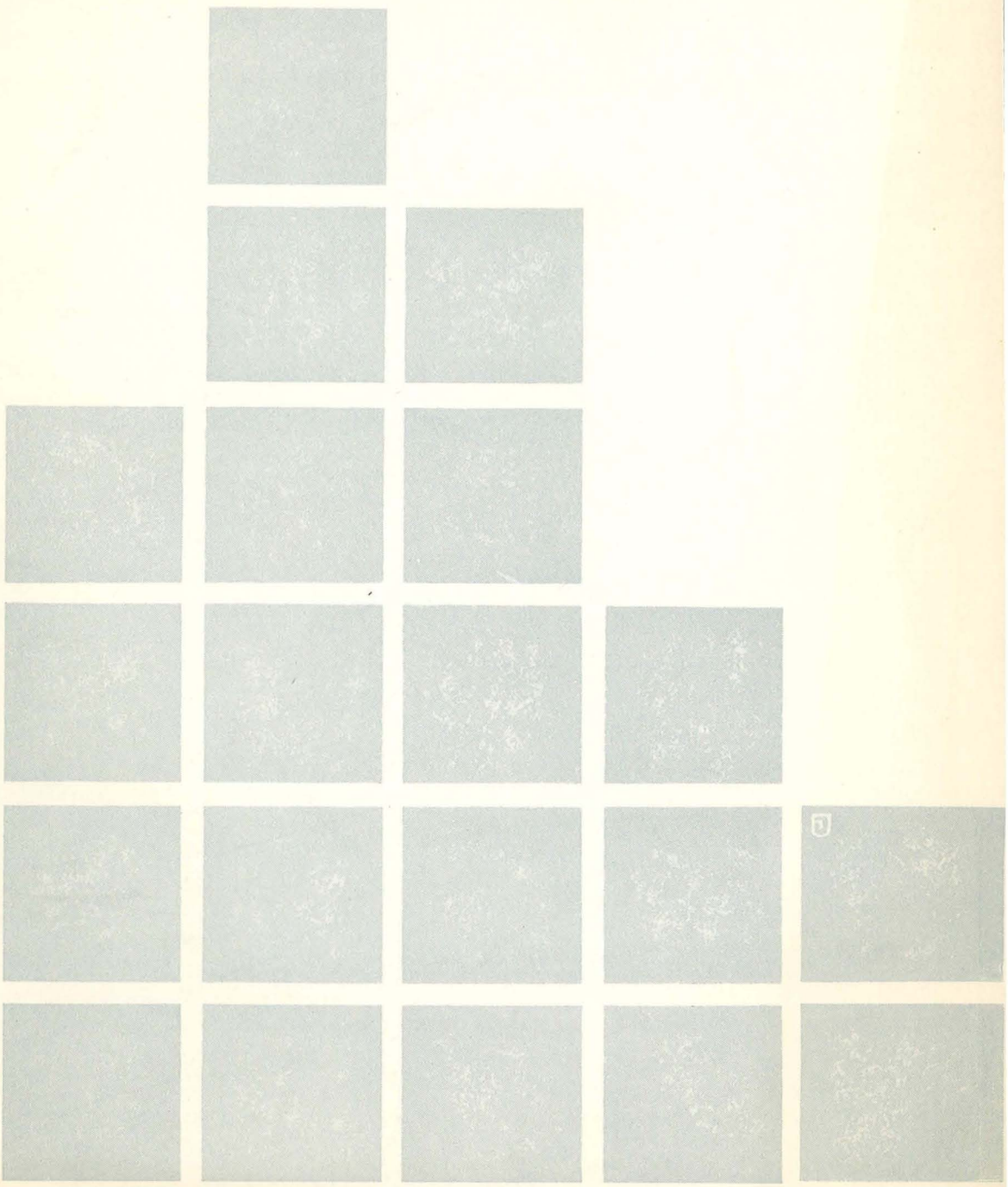
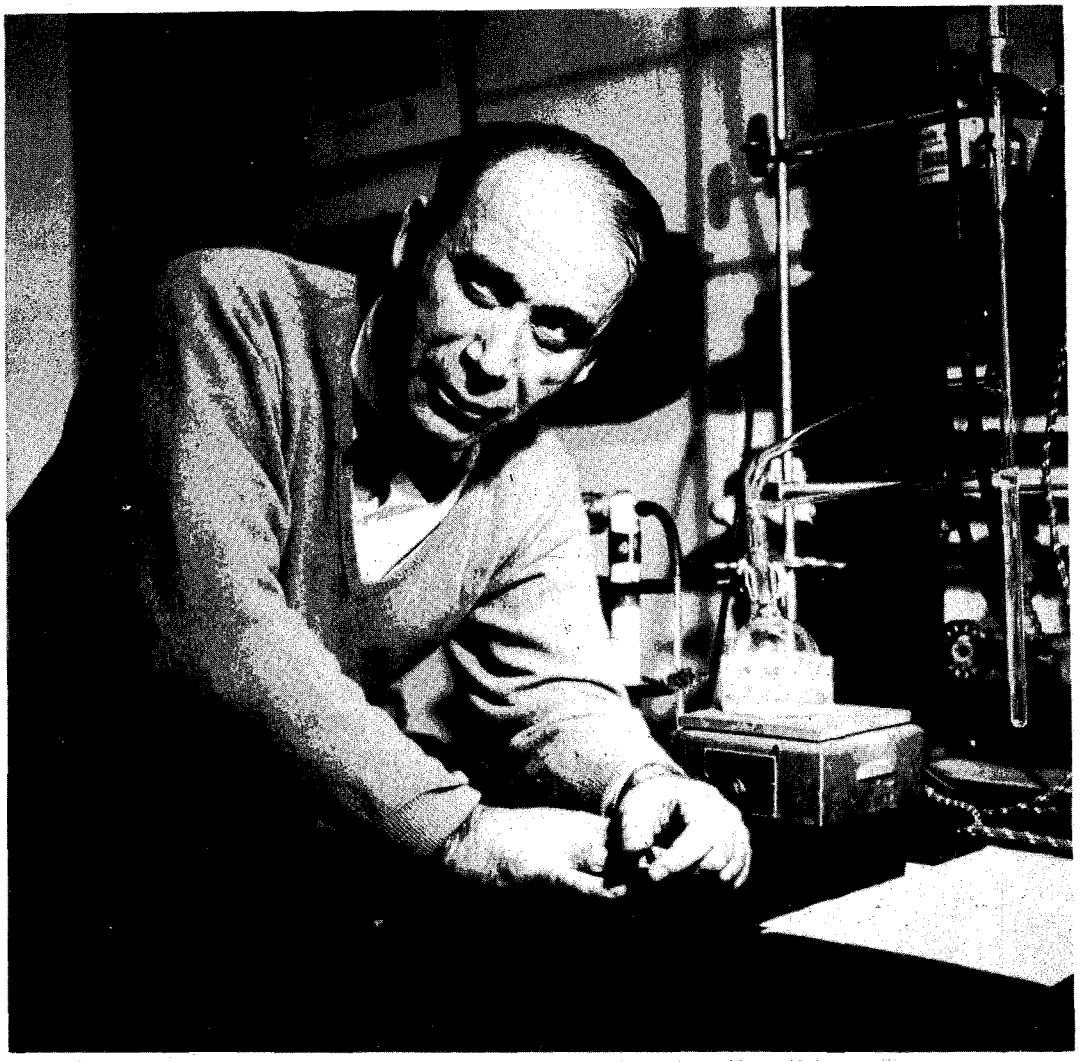
神経化学

VOL. 5 NO. 3 JUNE 1966



神 経 化 学 懇 話 会



To my friend and colleague with all
good wishes for the future H C Andrews

—H. Waelsch教授の追悼—

Heinrich Waelsch教授逝く

慶応大学医学部生理
塚田裕三

昨年の春頃からWaelsch博士が脳腫瘍らしいというNewsは吾々の耳にも入っていた。その后手術をされ軽快されたかの如くで筆者が昨年5月ニューヨークを訪れた時もお見舞い方々ご自宅を訪問してお話しする機会があった。その時は秋に日本で開かれる予定になっていた日米神経化学コンフェレンスの打合せをかねてうかがったのであったが，私の様な素人にもやはりかなりの重症だという印象をうけた。その時彼はこの機会にどうしても日本に行きたいと強硬に云っておられたし、学者として学会に出席して倒れるのは本望であるとまで云はれ，同席された成瀬浩博士と顔を見合せたものだった。

その后は放射線療法を受けておられた様であったが，亡くなる数週前まで研究室に出て来て居られた由で学者らしい彼の強さがうかがわれる。そして遂に日本で再びお会いすることもなく本年3月22日61才の生涯を終わられた。

Waelsch博士に就いてはもう御紹介するまでもなく，近代神経化学の最も有力な指導者であり研究業績の上ばかりでなく，若手研究者の育成やら国際的な組織づくりに尽力された同氏の功績は高く評価されねばならない。

Heinrich Waelsch博士はコロンビヤ大学の生化学の教授であり，同時にニューヨーク州立精神医学研究所の荼理部門の長であった。又最近新設されたニューヨーク州立神経化学麻薬中毒研究所の所長でもあった。そして昨年12月には神経化学に対する貢献により，米国精神神経疾患研究財団より賞を受けられた。

Waelsch博士は1905年にオーストリヤのBrunn（現在はチェコスロバキアのBrno）で生れた。1928年プラーグのGerman Universityで医学士の学位を得，1930年に化学教室から博士の称号を受けた。又1930—1931年にかけてはKaiser Wilhelm研究所で研究したこともあった。その後プラーグ医科大学で講師を勤めていたが，1939年に米国に渡り，コロンビヤ大学医学部のResident Associateとなった。その后はコロンビヤ大学にとどまり，アミノ酸及び蛋白質の生化学的研究を広汎に行ってきた。そして晩年の20年間はもっぱら脳の生化学的研究を行い，精簿やてんかんにグルタミン酸投与を試みたのも彼であった。

1953年には Neuberg Medal を受賞している。Waelsch博士の著書は300を越えると云はれ彼の研究活動の旺盛であったことを物語っている。同博士の夫人 Dr. Salome G. Waelsch は Albert Eeinstein 医科大学の遺伝学の教授である。家庭には一男一女があり現在共に Wisconsin 大学の学生である。

自宅は90 Morningside Drive, New York City である。故人の遺志で葬儀は行はれず4月7日にコロンビア大学で同僚，知人，門弟が集まって“Memorial Meeting”が催された。その時の講演要旨が未亡人より送られてきたので別項に掲載してある。

Waelsch博士の死はこの道の敬愛すべき指導者を失ったということでその悲しみは一入であり，今国際神経化学会の設立を前にして惜まれてならない。J. Neurochem. でも H.Waelsch 追悼号を S. S. Kety を Editor として増刊として出すことになっている。こゝに同氏の冥福を祈りつつ，神経化学の今后の発展を期待したい。

Waelsch 先生の訃報に接して

慶応大学医学部生理
高垣玄吉郎

Waelsch先生がなくなったという知らせをいただきましたとき，ご病気のことはまえまえからうかがっておりましたので予期していたことではありましたが，やはり改めてもっと長くいきていていただきたかったと考えたことでありました。私は1958年9月から1960年9月まで丁度2年間 New York State Psychiatric Institute （コロンビア大学）の先生の研究室に留学しておりました。1964年春，ふたゝびニューヨークの研究室におたづねしたときはまったくご元気で，昨年10月行われた日米神経化学コンファレンスの準備がはじめられようとしていたときでありましたので，その性格や計画についていろいろとお話を致したことを思いだします。そのときは東京大学の成瀬さんが留学されており，先生は成瀬さんの人となりをたゝえ研究者としても高く評価しておられまして，私までも非常にほこらしく思ったのでありました。

私が先生のお名前をはじめて知りましたのは，1951年，Advances in Protein Chemistry, 6, 299–341 におかきになった Glutamic Acid and Cerebral Function という綜説をよんだときであります。その前年，1950年には，H. Weil-Malherbe によって Significance of Glutamic Acid for the Metabolism of Nervous Tissue という綜説が Physiological Reviews にでていますから，そのころはグルタミン酸についての関心が非常にたかまってい

たのでありましょう。私はそののちグルタミン酸の代謝と直接間接に関係のあることの研究をつづけておりましたので，アメリカ留学の可能性ができましたとき，なんの躊躇もなく Waelsch 先生にお手紙を書いて留学のことをお願いしたのでありました。特に推薦して下さるかたがあったわけではなく，また私がはじめての日本人留学生であったそうでありますから，先生も随分物好きな採用をなさったものだと思います。Waelsch先生はチェコスロバキヤのお生れで大学を卒業されてからアメリカに移られたのだそうでありますが，その当時は私はそんなこともまったく知りませんでした。留学するほうも随分無鉄砲であったわけであります。しかし，今日考えてみて非常に恵まれた有意義な留学生活であったと感謝しております。日本には先生と親交のあるかたがたも多いかと存じますが，実に心あたゝまる人がらでありました。agreeable person だといわれているのを聞いたことがありますが，本当に気持のよい人でありました。

研究に対する態度は真摯そのものでありました。天才的なアイディアにもとづいて研究するというより，むしろ大胆でねばり強く問題を追究するというタイプであったと理解しております。1943年から1950年にかけて，さきにあげた綜説のもととなっているところの，脳のグルタミン酸についての多くの原著を発表しておられますが，それらを一貫している研究の発想と方法は実に先生の特徴を示していると思います。問題のとらえかたと最初の発想はかなりに冒険的であり独断的でありますが，いったんはじめられたものは，これでもかあれでもかとねばり強く追究していかれました。今日，グルタミン酸の定量法としてはペーパークロマトあるいはカラムクロマトによる方法や酵素的方法が用いられて，Waelsch先生が最初に用いられたやえこしい化学的方法はまったく実用されていません。しかし，小発作や精神運動発作に対してグルタミン酸が有効であることを発表された（1943年）あと，どうしても脳内のグルタミン酸を定量することが必要だと考えられて，あの面倒な方法をおそらく当時の先生の研究室の知恵をしぼってあみ出されたのだと思います。脳内にグルタミン酸が高濃度に存在すること，血液中から脳内には入らないことは，先生によってはじめて明らかにされました（1950年）。時を同じくして H. Krebs の脱炭酸酵素による定量法とそれによっても脳内のグルタミン酸が高濃度であることが発表され，ペーパークロマトやカラムクロマトの方法が普及実用されるようになってしまいしまたが，パイオニアとしての偉さはやはり高く認められるべきであると思います。Myelination の生化学的研究にしても，発生と脳代謝の問題にしても，パイオニアとしての貢献は大きいものがあります。

IBROの仕事がUNESCOのなかではじめられたときは，その最初から熱心に参画しておられました。IBROの活動がやっと軌道にのろうとしているとき，その創立者の1人を失ったわけであります。Journal of Neurochemistry をそだててこられた1人であり，International Neurochemical Symposia の創設者であり，来年発足しようとしている International Neurochemical Society の発議者でありました。その人がらからも，その活動力からも，このような学問の国際交流において，とくに神経化学の領域ではかけがえのない適任者でありました。しかし，所謂政治家ではまったくなかったと思います。真摯な学問愛好者であり，温かい人格者でありました。

Waelsch先生のお葬式はその遺志により行われず，追悼会が大学の講堂で行われたそうでありますが，このことはWaelsch先生をよく知るかたがたによってその遺志が正しく理解されてなされたことであると思います。先生の人格の一端を示しているように思われます。

New York の East River の Ward's Island には数年前，先生のために New York State Research Institute for Neurochemistry and Drug Addiction がつくられました。その規模はアメリカとしては決して大きいものではありませんが，設備のすみずみまで先生の趣味がにじみでているような研究所であります。Lajtha, Cheng, Clouet はすでにこゝにうつって研究しています。Waelsch先生もこの研究所にうつることを予定しておられたようであります。この研究所には先生のために立派なofficeができていました。こゝを見学したあとで，古いコロンビヤ大学の研究室に先生に“さようなら”を申し上げに行きましたときに，“新しい研究所の office は Emperor の office のようだろう”とニヤニヤしておられましたが，それが直接お目にかゝった最後となってしまいました。

私が直接先生のもとで研究をしましたのは，2年間にすぎません。しかし，先生の影響は長く私のなかに残るだろうと思います。私はそれをほこりにし，ご恩にむくいて立派な研究をなしとげるように努力致したいと思います。葬式をおことわりになった先生ではありますが，月並みなようでも最後に先生のご冥福をお祈りして筆をおきます。

Waelsch 先生の思い出

国立精神衛生研究所

成　瀬　　浩

Waelschの事を考えると，去年9月 New York 出発直前，彼と最後に会った時のことがい

つも思い出される。わざわざ出かけて来てくれて，自分の写真を渡しながら，「この写真のように元気になって，また日本でお前に会いたいよ」と言った時の，複雑な，深い表情をたゝえた彼の顔付きを，私は決して忘れられない。脳障害患者の感情障害の症状だったのかもしれない，しかし，私には，彼が自分の病気の予后を承知した上での，別れの挨拶だったとしか思えない。

昨年4月初め，研究室のお茶の時間に上肢の麻痺が始った。それを皆にかくそうと健側の手でかばいながら，なにげなく雑談をつゞけていた。翌日入院。翌々日緊急手術。しかし病巣は拡っており，脳幹であり，全く手術不可能であり，やがて強力な放射能加療が始った。

主治医は初めは脳栓塞と言い，やがて良性脳腫瘍と説明した。彼はそれを真にうけていたかの様であり，人に会ふたびに元気にジョークをとばしていた。しかし6月頃から，彼の親しい神経学者や研究室のごく一部の人々は，Waelschが自分の病気の本当の性質を知っている様だというひそかな噂さがつたわり，それらの人々はそれを信じていた。5～6月頃，秋の日米神経化学レンポジアムの準備の相談をしながら，「いよいよ俺もアジアに行くか。俺はマレーのジャングルの上を飛ぶのが少年の時の夢だった。高垣が京都の本をくれてから，京都を見るのがとても楽しみになった」などと話していたが，一方その頃から彼自身は不参加という前提でこっそりといろいろな事を進めて行っていた。

6月から7月にかけて小康を得た時には，研究室で，一人一人の研究の話しをきいて廻った。私には，実験のことだけでなく，将来の職業上のこと，個人的なことなどいろいろと忠告もしてくれた。日本の学会の実情について愚痴をこぼすと，本当に心配そうになぐさめてくれた。臨床家として彼のような患者の予后を知っている私にとり，さらにまた彼自身その事を知っていると感じていた当時の私にとり，彼のやさしい心づかいが胸に痛い程しみこむ様で，さりげない顔をするのが本当に苦痛であった。

ナマリの多い英語で，ズバズバ物を言う彼には，随分敵が多かった。彼の身近かな人でも彼を烈しく攻撃する人もいた。しかし彼が本当に信用した人には，極端な位の過庇護を示した。彼自身そういう人間的な弱点を自覚しており，「こういう点を人にとやかく言はれるんだが，信頼出来る仲間は俺の宝なんだからな」としみじみ話していた。

高垣さんの活躍のお陰で，日本人研究者に対しては非常に好意的であった。日米神経化学シンポジアムについても，初めはワシントンの極めて冷い反応に，計画の全てを放棄しようとしていたが，また思いなおし，忙しい時期だったが，彼一流の押しで組織を進めて行ったのも，日本えの強い好意があったからであった。彼の長年の glutamotransferars の研究を担当して

いた若い研究者がついに仕事を失敗したとき，彼は私に，「これは神経化学の大切な仕事だ。日本人ならやれるだろう。是非日本の優秀な酵素学者を探してくれ」と強く頼み，外国人の多い研究室の中で気まづい空気が流れたりしたこともあった。

勿論彼の本質はやさしいボスではない。むしろ古武士的なはげしい人柄であった。昔は怒ってピペットを折り床に叩きつけることがしばしばだったという。私も彼の途方もない大声におどろかされたこともあった。若い人々の論文は10回突きかえされた。あやふやな研究方針を出して，その研究を中止させられた人もあった。「お前の question は何なのか。これは面白そうだなどという事で仕事に手をつけるな。はっきりした question を持って，それに答えるために仕事をしろ」というのが口癖だった。

彼はこの2－3年間 RNA と神経機能の問題，神経系の Regulation, アミンと蛋白など巾広い研究体制を一人で完全にコントロールしていた。これらの一見バラバラな仕事を，一定の目標に integrate する明確なプランが，彼の頭の中には出来上っていたようであり，機嫌のよい時はその構想をぽつぽつともらしていた。また彼は発病少し前頃から，「自分の考えを，長い論文にまとめ，神経化学についての自分の考えを世に問うつもりだ。お前もその中のRegulationの所を少し手伝ってくれ」とも言っていた。

彼は Neurochemistと言はれることを好まなかった。「俺は脳を中心に研究している生化学者だ」といつも話していた。しかし彼の巾広い知識と，活発な興味，複雑な現象の中に筋道をつくって行く能力などは，彼こそ Neurochemistとして，若い学問を推進して行く上の最適任者だったことを示している。彼は今倒れることは，本当に心残りであったろう。「彼があともう数年働けたら」という深い感慨がどうしても胸を去らない。私の師は多い。しかし一緒に働いた時間は短かかったが，彼の影響は一番強く私を左右しているようだ。

Waelsch 先生の死去

東京大学医学部精神科
中　村　睦　郎（在ニューヨーク）

Waelsch先生死去のニュースが電話で伝わりましたのは3月22日の午前。同室の Dr. Cheng が電話口から帰って来て沈痛な表情で“Dr. Waelsch died this morning”と私に伝えてくれたあと二人共暫くは無言のまゝでした。かねてからWaelsch先生の病気のことはよく分って居り，特に今年に入ってからは容態がすぐれず研究室にも姿が見られなくなり（12月末迄は殆ど毎日午前中は研究室に出て来て居られましたが），病気が次第に悪化して来ていることは Dr.

Cheng などから聞いて居りましたので死去の知らせは予期しないことではなかったのですが，それでもやはり一人のかけがえのない偉大な神経化学の先覚者を失ったという思いと研究室の中心的存在がなくなったということで淋しさを禁じ得ませんでした。Waelschの研究室はこれで間もなく解散することになる模様で（大部分の人は Wards Islandの研究所に移る様です），Waelschが兼任していた Wards Islandの研究所の所長も未だ決って居りません。

今回の病状の経過ですが，之は成瀬先生がかなりよく御存知のこと、思います（特に手術の際の様子などは)。成瀬先生帰国後のことを私の知った範囲で簡単に書きますと，昨年暮迄は右半身の軽い麻痺のため杖をつき乍らも殆ど毎日午前中だけは研究室に顔を出して研究室の誰彼をつかまえてはよく話をされているのを見かけました。昔に比べると随分衰えた（特に intellectualな面で）という話でしたが，しかし学問に対する熱烈な関心と興味は最近迄衰えなかったようで，今年に入ってからも自宅に研究室の人が訪ね学問の話になると夢中になって話しこまれたということです。今年に入ってからは殆ど自宅にとじこもったきりで，時々研究室の人が訪ねて行った時の印象では衰弱が更に目立っているとのことでした。死去の暫く前から眠られることが多くなったということですから意識障害の様なものが始っていたのかもしれません。

葬儀はWaelsch先生の遺言に従って取りやめ，その代りに Memorial Meeting が4月7日の午后5時から新築の Columbia大学医学部の Alumni Auditorium で行われました。この時の様子を簡単にお知らせ致します。Memorial Meeting といっても花輪一つなくただ広い講堂に参会者が200～300人集まり壇の上には Chairman の Dr. Merritt (Professor of Neurology, Neurological Institute) がただ1人座り，4人の追悼の辞を述べる人が1人ずつ壇上に上って話しをし，最后に司会者の Dr. Merritt が閉会の簡単な挨拶をして終りというしごくあっさりしたものでした。

先ず Dr. Chargaff （コロンビヤ大学医学部の生化学教授）はWaelsch氏の略歴や活動を述べ，Dr. Kety は主として友人としての立場から彼の人柄について語り，Dr. Morison は特にＩＢＲＯに於けるWaelsch氏の国際的な活躍について話し，最后に Dr. Sachs は9年前約4年間 Waelschの研究室に学んだ Waelsch の弟子としての経験を語りました。いずれもWaelsch先生の学問に対する真摯な情熱と謙虚な一面，ウィットに富んだ人柄，そして又神経化学に於ける先覚者的な偉大な業績と国際的な交流に果した大きな役割をほめたゝえ，かけがえのない師であり友人であった故人の死を悼む言葉に満ちて列席者の胸を打つものがありました。その後の事につきましてはいづれ後便でお知らせ致します。

(以上4月10付の塚田宛の中村睦郎氏の手紙を掲載させて頂きました)。

IN MEMORY OF HEINRICH WAELSCH

Erwin Chargaff

Heinrich Waelsch, whom we have come to remember, was an unconventional man; and it is therefore perhaps fitting that this should be an unconventional meeting. He was an unusual man; and the best tribute I can pay to him is that these my few words should not be the usual eulogy. I have known him for something like 27 years, and during all this time we have been colleagues and friends. So I should like to say a few words about HW as a friend; the scientist will be considered by others.

I have, perhaps, another claim to the distinction of opening this meeting. And that is that HW and I were born in the same part of Central Europe, in what used to be called the Austro-Hungarian Monarchy, and we were born in the same year. He grew up in Prague and I in Vienna; while we were in High School the Monarchy disappeared, and we found ourselves in different countries. But Austria is a state of mind, not a term in geography.

Those that believe that Austria stands only for Wiener Schnitzel, Strauss waltzes and similar desirable things are very much mistaken. Leaving aside the great names at the Medical Schools and such giants of Science as Boltzmann and Mach and Landsteiner, many revolutions -- artistic and conceptional -- started there in those remarkable early years of the 20th Century: Freud and Schoenberg, Webern and Alban Berg, Kokoschka, Loos and Kraus, and how many others! One of the few great poets of this Century, Rainer Maria Rilke, comes from Prague. The so-called Vienna School of philosophers: Carnap and Reichenbach and Frank and Wittgenstein, could also be called the Prague School. Modern linguistics started in Prague: the Linguistic Circle was known the world over. It was in Prague that Albert Einstein held his first professorship, 1911-14. When HW was born, Franz Kafka was 22 years old and had just begun to write. It was a rich life, though not an opulent one. Society had not yet become affluent and refrained from reaching with its tentacles into every crevice of private consciousness.

Everyone with any intellectual pretensions had the right -- yes, even the obligation -- to remain an individual.

And this is what HW remained all his life. He had a strong sense of quality -- in life, in art, in science -- and it cannot have been easy for him to maintain, to exert, this individuality against the enormous pressures of conformity to which we are all subjected in these days. He was a witty man, a sharp observer of life around him, and not one to suppress his reactions. I for one am grateful when I encounter such a man. He may have his ups and downs; only mediocrity is of uniform quality. At a time when the entire world begins to look like The Man from UNCLE, I am grateful for the exceptions.

Under the surface of intellectual hardness there was a man of great sensitivity. He helped many people in many things; and it certainly speaks for him that it took me a very long time finding this out.

I have said that I wanted to speak of HW as a man, not as a scientist. But I find it very difficult to separate one from the other. This is what, perhaps, distinguishes science -- and I use this word for all pursuits of learning, not only for the natural sciences -- this, I say, distinguishes science from most other professions; namely, that it impregnates the entire man. Who once has drunk from this source, remains thirsty all his life. Jakob Böhme could be a cobbler in daytime and a mystical philosopher at night. But how many scientists manage to do this? They all are marked by a habit-forming branding iron.

At the same time, an intelligent scientist -- and HW was a very intelligent scientist -- knows what brittle a thing science is. It is an eternity that lasts a moment; an intensity that has no duration; a vacuum that can never be filled entirely. Scientific ideas are in a continual Brownian movement; they collide with each other and repel each other; they are here today and nowhere tomorrow. To know when you deal with a real flame and when with an ignis fatuus requires great courage, perception, and optimism.

I believe, HW kept his optimism to the very end. A few weeks before his death he told me about papers he was writing. One half of what makes a good scientist, the power of imagination, was operating more actively than ever.

Perhaps I ought to say a few words about his early days. He came from an intellectual and scientific family. His father was Professor of Mathematics, his uncle an eminent medical man. In the Gymnasium he must have had, to judge from my own education, plenty of Latin and Greek and History, etc. He received the M. D. degree from the German University of Prague in 1929 and one year later a doctorate in natural science. He remained in Prague till 1938, the last 5 years as Privatdocent of Physiological Chemistry. He came to Columbia University in 1939. The man who had the greatest scientific influence on him, before he came to this country, was probably Max Bergmann with whom he had worked for a time in Dresden. Incidentally, Max Bergmann, the last offshoot of the great Emil Fischer school and without question one of the great organic chemists of our time, spent the last 12 years of his life here at the Rockefeller Institute. But he received amazingly little recognition in this country and when he died in 1944 he was not a member of the National Academy.

HW belonged to the generation entre deux guerres: he was slightly too young for the First, slightly too old for the Second World War. His family had owned a summer house in the Dolomites, in what is now called Alto Adige, but used to be South Tyrol in his early days. He was particularly in love with that country and always liked to return there.

But how can a catalogue of details -- were it ever so complete, were they ever so correct -- how can a catalogue describe a man? Individuum est ineffabile, the scholastics said; the individual cannot be defined. He survives in those that have loved him and in his friends, though even the distant world grows richer by those it has lost. Great reticence is indicated in speaking of another man, or even of oneself. The writers of great autobiographies knew

this very well: Goethe called the story of his life Dichtung und Wahrheit, poetry and truth. Please bear with me if I have limited myself to the latter.

A good scientist is greater than the sum of his papers. We shall hear about this in a moment. Of a great teacher it can be said: He learned much, he taught more. This too will be taken up soon. I should only like to add a few more words. What always struck me about HW was the great seriousness with which he confronted the concepts and the consequences of science, and not only of his own science. He had a deep appreciation of scientific quality and a warm regard for those who in his opinion lived up to the demanding obligations that science imposed. He could be ironical and cutting; but I remember him as courteous and friendly. Long before I had met him, I remember a friendly word that he wrote me about a paper of mine which he had liked.

Those that went to see him in the last sad months of his life may have noticed, as I did, how all the defensive surface qualities had given way to an astonishing mildness. And with what courage, with what truly amazing courage, he bore himself! He was a master in the Ars moriendi. As we both learned in school, Heinrich Waelsch: Ave, vale!

****

HEINRICH B. WAELSCH — THE SCIENTIST

Seymour Kety

It is not easy to speak briefly or dispassionately about the qualities which made Heinrich Waelsch so pivotal a figure in modern neurochemistry. There are some whose strength has derived from the nutriment of their times but, occasionally, others who have made the Zeitgeist. He was one of those.

Our generation has witnessed the development of neurochemistry as a distinct and powerful discipline with important roots in biochemistry and the neural sciences. He was in the vanguard of that development and in a number of ways responsible for it. He was not pretentious enough to have planned it that way, yet his scientific career and his efforts in the world scientific community seem in retrospect uniquely designed to establish the status and ap-

propriateness of neurochemistry and to strengthen its relationships with other areas of knowledge.

He moved from biochemistry to neurochemistry bringing with him the dynamic approach, the concepts, rigor and techniques of the parent discipline. His greatest experimental contributions were in protein and amino acid metabolism, both in the organism generally and in the nervous system where he pioneered. His studies on the pathways and enzymes involved in histidine degradation, glutathione synthesis and glutamine metabolism were classics in the field and his work on protein sysntheis and turnover in the brain is the basis for much of the current interest and research in this area especially with respect to its relationship to memory - an interest which he shared and in which he was actively engaged even during his last illness.

Other areas of neurochemistry felt his impact. Transamidation is a process which he first characterized, the significance of which we will appreciate as we learn more about the physiological roles of the biogenic amines. His last laboratory work was in the important area of carbon dioxide fixation which, again, he approached not simply from the point of view of biochemistry but with a special interest in defining the interrelationships of that fundamental process with physiological neural function. His last contribution to that area was in a paper which was published only recently in the Proceedings of the National Academy of Sciences and which he wrote during his last illness.

He would have contributed significantly to neurochemistry had he done no more than his rigorous and important research, but that was not enough for him. Recognizing that neurochemistry was a fledgling discipline, he dedicated much of his energies to bolstering it, to establishing its importance, to strengthening its interactions with other sciences. Some of us who were fortunate enough to be associated with him in those enterprises will not forget that it was he who generated the idea or who pulled the first group together, whose interest never waned and who devoted himself wholeheartedly to the enterprise. I remember the First International Neurochemical Sympo-

sium at Oxford and his opening address from the high table in Magdalen College. It was he who insisted that these symposia be devoted to interfaces between neurochemistry and other sciences and it was through that philosphy that these symposia became seminal elements in the growth of the discipline.

When the time was appropriate he threw his efforts into the importance to the discipline of having a journal of its own and mobilized the efforts of those who agreed with him to establish the Journal of Neurochemistry, which has had a gratifying and flourishing history.

I remember a meeting at the Institute Marey in Paris to which Waelsch invited me, where I think it is fair to say the planning was begun which lead to the establishment of the International Brain Research Organization which was to occupy a great share of his efforts in later years.

Although I knew him first and always respected him as a scientist, I admired him for his human qualities. He possessed both imagination and rigor in a remarkable combination. He was impatient with scientific nonsense and with any form of pretentiousness for his perspective included a realistic appraisal of his place in the universe. His nimble mind coupled with that humility and unpretentiousness gave him a remarkable wit and sense of humor which livened every encounter with him, whether it was a lecture or a symposium or a conference or a simple personal interaction.

These qualities which characterized his scientific career and his personality pervaded and enriched the last year of his life. We will always remember our last meetings with him - the executive committee of the International Brain Research Organization which he left a postoperative bed to attend. He apologized for the inconvenience of holding the meeting at the Neurological Institute, adding wryly that although he had always been a student of the brain he had never expected to fall into the clutches of the neurosurgeon. We will remember the first meeting of the Committee on Brain Sciences of the National Academy of Sciences, a group which he was primarily instrumental in founding, which he attended and enlivened even though it meant the great

effort of a trip to Washington. Many of us were fortunate enough to hear his paper and enjoy his discussion at the last scientific meeting which he attended in Puerto Rico less than four months ago. Despite some neurological handicaps his intellectual qualities were superb. Even after he was confined to bed and to the very end of his illness, he retained his scientific and mental vigor, his wit and his spirit at an undiminished level. He would talk of the experiments he was planning, unwilling to acknowledge even to himself that they might not be completed. No single lifetime is enough to bring to completion all of the achievements of a prolific mind. His impact on neurochemistry and on all of the sciences of the brain will remain as a rich and enduring memorial.

****

HEINRICH WAELSCH AS SCIENTIFIC STATESMAN

Robert S. Morison

The first time I met Heini Waelsch was many years ago when he came into my office at the Reckefeller Foundation to discuss the possibility of some help for his laboratory. He seemed at that time to be wholly absorbed in his scientific investigations and it never occurred to me that I would know him later as a scientific statesman and administrator. As a matter of fact, he never did develop the usual earmarks of the organization man. He succeeded in the world of affairs as he did in the world of pure science because of his straight-forward and complete dedication to the truth. There was never any mincing of words, no pulling of punches, no careful guarding of opinion for the sake of diplomatic effect. Never could I detect in him the slightest tendency to use his political position to forward his own career.

When pleading the case for help to some organization in which he had an interest he was always disarmingly frank about its weak points. Although these candid admissions might have jeopardized the case of a less forceful negotiator, they only served to strengthen his effectiveness. Anyone who saw the defects in a situation as clearly as he did simply had to be right when

he set out to extol its virtues.

During the last 3 years, we served together as members of the Board of Scientific Counselors of the National Institute of Mental Health. I tended to look forward to these meetings, largely because I looked forward to seeing him and listening to his penetrating questions and comments on the widely varied researches that would be spread before us by the staff. Although his own work lay within a fairly restricted area of brain biochemistry, he seemed to have become familiar with many other approaches to the study of human behavior - physiological and psychological and even sociological.

He was of course a real pioneer in modern brain biochemistry and played an important role in establishing the field as a recognizable entity. Together with Dr. Kety and one or two others, he organized and promoted the informal international meetings known as " neurochemical symposia". The published proceedings contain many specific contributions to knowledge, but the principal effect of this very informal but always delightful enterprise was to make the scientific world realize that the time had come when it would be really worthwhile to apply modern biochemical techniques to understanding how the brain works.

An equally important by-product was the birth and fostering of many friendships among previously isolated workers in what was then a novel field.

Indeed, it was through attending a couple of these meetings that I came to know Heini as a friend as well as a scientist and organizer. Although I never saw as much of him and Salome as I could have wished, I remember the occasions when we did meet with unusual clarity. It is astonishing how he could make the simplest meeting memorable by some special insight into a confusing situation, some unusually illustrative anecdote or penetrating aphorism.

It was he, for example, who nearly 2 decades ago acquainted me with the proposition that the pursuit of science is in Germany a profession, in England a gentleman's avocation, and in America a business - long before such

a thing as grantsmanship was even thought of. In a curious way, he himself appeared to combine the best features of all three attitudes. One could only admire his businesslike handling of affairs, respect his professional dedication to the way of the investigator, and rejoice in sharing the uncontaminated pleasure of his pursuit of science for its own sake.

By far, his most ambitious international undertaking was the part he played in getting the International Brain Research Organization under way. My notes show that he started thinking about some form of international institute for brain research over ten years ago. Like many other emigres, he felt keenly the contrast between the relatively good facilities on this side of the Atlantic and the relatively poor ones elsewhere in the world. It bothered him greatly that so many of his European colleagues found it difficult to keep up with the parade of science simply because they were handicapped by inadequate facilities and assistance. He, therefore, gave a good deal of time and thought to the possibility of developing at some central location an international laboratory which would provide suitable facilities for a wide range of investigations relating to brain function. For various reasons this never developed into a concrete reality, but much of the thinking which lay behind it turned out to be useful in the formation of IBRO. He was one of the most active members of its first executive committee and his wide acquaintance among Eastern and Western scientists did much to compose the differences of opinion which tend to confuse the affairs of international activities of this kind. For two years he served as its principal executive officer. I had a number of conversations with Heini about IBRO, and I am afraid that I would have to confess that I never entirely shared his enthusiasm for this complex and difficult enterprise. On the record, however, it has achieved a number of successes and I believe that many of them came as a result of his clear and hard-headed appraisal of the realities.

Active as he was in the affairs of a member of different laboratories and scientific organizations, he never lost his amateur standing as an ad-

administrator. As a professional he seemed to me to be completely identified with science and he never looked to administation as a means to power, prestige, or affluence. As far as I could see he engaged in such matters as the neurochemical symposia, or IBRO or the study sections and councils on which he served merely because he felt that the sciences, and the scientists he was interested in, would be the better off for his participation. Of course, he was right about this as he was about so many other things.

Those of us who relied on his help in reaching decisions, as we enjoyed his friendship and admired his research, will sorely miss him.

—神経化学文献—

CLASSIFICATION OF NEUROCHEMISTRY TITLES

I.	General Neurochemistry	356-382
II.	Electrolytes, Metals & Inorganic Constituents	383-399
III.	Carbohydrates & Related Compounds	400-407
IV.	Amino Acids, Peptides & Related Compounds	408-422
V.	Proteins	423-426
VI.	Nucleic Acids & Related Compounds	427-428
VII.	Lipids, Steroids & Related Compounds	429-446
VIII.	Biogenic Amines	447-496
IX.	Neuro- & Psychotropic Drugs	497-533
X.	Subcellular Units	534
XI.	Enzymes & Cofactors	535-556
XII.	Metabolism	557

LIST OF JOURNALS COVERED

A	Acta Neurol. Scand.	42(1)
	Acta Physiol. Scand.	---
	Acta Psychiat. Scand.	---
	Am. J. Physiol.	210(3)
	Am. J. Psychiat.	122(9)
	Analyst	91(1079)*, (1080)*
	Anal. Biochem.	14(2)
	Anal. Chem.	38(4)
	Arch. Biochem. Biophys.	113(2)*, (3)*
B	Biochem. Biophys. Res. Commun.	22(5), (6)*; 23(1)*
	Biochem. J.	98(3)
	Biochem. Pharmacol.	15(2), (3)
	Biochem. Z.	344(1)*, (2)*
	Biochemistry	5(3), (4)
	Biochim. Biophys. Acta	112(3)*; 113(3); 116(2); 117(1), 118(1)
	Brain	88(5)
	Brain Res.	1(2)
	Brit. J. Pharmacol.	26(2),
	Brit. J. Psychiat.	112(483), (484), (485)
C	Can. J. Biochem.	44(3)*
	Can. J. Physiol. Pharmacol.	44(2)
E	Electroencephalog. Clin. Neurophysiol.	20(3)*, (4)

	Ergeb. Physiol. Biol. Chem. Exp. Pharmakol.	---
	Exp. Brain Res.	1(2)
	Exp. Cell Res.	41(1)*, (2)*, (3)*
	Exp. Neurol.	14(2), (3), (4)
F	Federation Proc.	25(2), pt. 1*, pt. 2
H	Hoppe-Seylers Z. Physiol. Chem. ..	---
I	Intern. J. Neuropharmacol.	5(2)
	Intern. Rev. Neurobiol.	---
J	Jap. J. Pharmacol.	---
	Jap. J. Physiol.	16(1)
	J. Biochem. Tokyo	59(2)*, (3)*
	J. Biol. Chem.	241(4), (5)*
	J. Cell Biol.	28(2)*, (3)*
	J. Cell. Comp. Physiol.	66(3), pt. 1*, pt. 2
	J. Clin. Endocrinol. Metab.	26(2)
	J. Clin. Invest.	45(3)*, (4)
	J. Exp. Med.	123(3)*
	J. Gen. Physiol.	49(49)
	J. Histochem. Cytochem.	14(2)*
	J. Lipid Res.	7(2)
	J. Neurochem.	13(2), (3), (4)
	J. Neurol. Sci.	3(1)*, (2)*
	J. Neurophysiol.	29(2)
	J. Pharmacol. Exp. Therap.	151(3)
	J. Physiol. London	182(3)*, 183(1), (2)
	J. Psychiat. Res.	---
L	Life Sci.	5(6)
N	Nature	209(5027-5030); 210(5032-5033)
	Naturwissenschaften	53(5-7)
	Neurology	16(3), (4)
	Neuropsychologia	---
P	Pfluengers Arch. Ges. Physiol.	---
	Pharmacol. Rev.	18(1), pt. 1 & 2
	Physiol. Rev.	---
	Proc. Nat. Acad. Sci. U.S.A.	55(4)
	Proc. Roy. Soc. London Ser. B. ...	164(994)*, (995)*
	Proc. Soc. Exp. Biol. Med.	121(2)*
	Psychopharmacologia	---
S	Science	151(3715-3719), 152(3720)*, (3721)
	Sci. Am.	214(3)

※印はその号についても検索しましたが，神経化学文献が見当らなかったことを示します。

I. GENERAL NEUROCHEMISTRY

356. Baggiolini, M. & Bickel, M. H.
A new type of incubation apparatus for the determination of metabolically produced $^{14}CO_2$.
Anal. Biochem. 14(2): 290-5, '66

357. Biscol, T. J. & Straughan, D. W.
Micro-electrophoretic studies of neurones in the cat hippocampus.
J. Physiol. 183(2): 341, '66

358. Bito, L. Z. & Davson, H.
Local variations in cerebrospinal fluid composition and its relationship to the composition of the extracelluar fluid of the cortex.
Exp. Neurol. 14(3): 264, '66

359. Eccles, J. C.
The fundamental importance of brainresearch.
Naturwissenschaften 53(7): 165, '66

360. Ershov, F. I., et al.
Propagation of Venezuelan equine encephalomyelitis virus in cells treated with actinomycin D.
Federation Proc. 25(2) pt. 2: T321-4, '66

361. Evans, J. I. & Oswald, I.
Some experiments in the chemistry of narcoleptic sleep.
Brit. J. Psychiat. 112(485): 401-4, '66

362. Fencl, V., et al.
Studies on the respiratory response to disturbances of acid-base balance, with deductions concerning the ionic composition of cerebral interstitial fluid.
Am. J. Physiol. 210(3): 459-72, '66

363. Huttenlocher, P. R. & Cohen, R. B.
Oxidative enzymes in spinal motor neurons in Werdnig-Hoffmann disease: A comparison with the axonal reaction.
Neurology 16(4): 398-406, '66

364. Ingram, C. G. & Brovins, W. G.
The reproducibility of the mecholyl test.
Brit. J. Psychiat. 112(483): 167-71, '66

365. Kása, P., et al.
Histochemical and ultrastructural alterations in the isolated archicerebellum of the rat.
J. Neurochem. 13(3): 173-8, '66

366. Klingman, G.I.
In utero immunosympathectomy of mice.
Intern. J. Neuropharmacol. 5(2): 163-70, Mar. '66

367. Knowles, F. & Bern, H.A.
Function of neurosecretion in endocrine regulation.
Nature 210(5033): 271, '66

368. Lajtha, A., et al.
Brain Research. (Meetings.)
Science 152(3721): 548, '66

369. Nyström, S.H.M.
Some aspects of the use of protons in the treatment of experimental brain tumors.
Naturwissenschaften 53(6): 159, '66

370. Nyström, S.H.M.
Immediate effects of protons on the mammalian brain.
Naturwissenschaften. 53(6): 159, '66

371. Oswald, I., et al.
Some experiments in the chemistry of normal sleep.
Brit. J. Psychiat. 112(485): 391-9, '66

372. Paulin, H.J., et al.
Determination of dimethyl sulfoxide in plasma and cerebrospinal fluid by gasliquid chromatography.
Anal. Chem. 38(4): 651-2, '66

373. Roberts, E.
The synapse as a biochemical self-organizing micro-cybernetic unit.
Brain Res. 1(2): 117-66, '66

374. Rosenblatt, F., et al.
The transfer of learned behavior from trained to untrained rats by means of brain extracts, II.
Proc. Nat. Acad. Sci. U.S.A. 55(4): 787-92, '66

375. Rosenberg, P., et al.

Similarity of effects of oxygen, sulfur, and selenium isologs on the acetylcholine receptor in excitable membranes of junctions and axons.
Proc. Nat. Acad. Sci. U.S.A. 55(4): 835-8, '66

376. Sandborn, E. B.
Electron microscopy of the neuron membrane systems and filaments. (with Figs. 1-35)
Can. J. Physiol. Pharmacol. 44(2): 329-38, '66

377. Shepherd, J.S., et al.
Amyotrophic lateral sclerosis:
A search for abnormal urinary substances by infrared scanning.
Neurology 16(4): 421, '66

378. Sullivan, T.M., et al.
Biochemical studies of families of schizophrenic patients.
Am. J. Psychiat. 122(9): 1040-4, '66

379. Vietinghoff, U.
Einfluss der Neurohormone C_1 und D_1 auf die Absorptionsleistung der Rektaldrüsen der Stabheuschrecke. (Carausius morosus Br.).
Naturwissenschaften 53(6): 162, '66

380. Volle, R. L.
Modification by drugs of synaptic mechanisms in autonomic ganglia.
Pharmacol. Rev. 18(1) pt. 2: 839-69, '66

381. White, R.J., et al.
Prolonged whole-brain refrigeration with electrical and metabolic recovery.
Nature. 209(5030): 1320-2, '66

382. Young, I.J.
Morphological and histochemical studies of partially and totally deafferented spinal cord segments.
Exp. Neurol. 14(2): 238-48, '66

II. ELECTOLYTES, METALS & INORGANIC CONSTITUENTS

383. Adelman, W.J., et al.
Internally perfused axons:
Effects of two different anions on ionic conductance.
Science 151(3716): 1392-4, '66

384. Baker, M.A. & Winokur, G.
Cerebrospinal fluid lithium in manic illness.
Brit. J. Psychiat. 112(483): 163-5, '66

385. Baker, P.F.
The nerve axon.
Sci. Am. 214(3): 74-82, '66

386. Brinley, F.J.Jr.
Ion fluxes in the isolated lobster giant axon.
J. Cell. Comp. Physiol. 66(3) pt. 2: 33-4, '65

387. Chandler, W.K. & Meves, H.
Ionic selectivity in perfused giant axons.
J. Cell. Comp. Physiol. 66(3) pt. 2: 65-9, '65

388. Coutinho, E.M.
Calcium, magnesium, and local anesthesia.
J. Gen. Physiol. 49(4): 845-6, '66

389. Dawson, J. & Bone, A.
The effect of thiols and ganglioside on the alterations in water, sodium and potassium distribution produced in brain slices by vasopressin and protamine.
J. Neurochem. 13(4): 257, '66

390. Ehrenpreis, S.
An approach to the molecular basis of nerve activity.
J. Cell. Comp. Physiol. 66(3) pt. 2: 159-64, '65

391. Medda, J., et al.
Osmolality of the differentiating central nervous system in chick.
Naturwissenschaften 53(7): 183, '66

392. Müller-Mohnssen, H. & Balk, O.
Zur Entstehung des K-Aktionspotentials.
Naturwissenschaften 53(5): 130, '66

393. Pappano, A.J. & Volle, R.L.
Lithium's failure to replace sodium in mammalian sympathetic ganglia.
Science 152(3718): 85-7, '66

394. Rojas, E. & Ehrenstein, G.
Voltage clamp experiments on axons with potassium as the only inter-

nal and external cation.
J. Cell. Comp. Physiol. 66(3) pt. 2: 71-7, '65

395. Shaw, D.M. & Coppen, A.
Potassium and water distribution in depression.
Brit. J. Psychiat. 112(484): 269-76, '66

396. Sjodin, R.A.
Some properties of skeletal muscle and giant axonal membranes deduced from movements of radioactive tracers.
J. Cell. Comp. Physiol. 66(3) pt. 2: 27-32, '65

397. Tasaki, I & Singer, I.
A macromolecular approach to the excitable membrane.
J. Cell. Comp. Physiol. 66(3) pt. 2: 137-45, '65

398. Villegas, R., et al.
Sodium influx and non-electrolyte penetration in stimulated squid axons.
J. Cell. Comp. Physiol. 66(3) pt. 2: 155-7, '65

399. Welch, K. & Sadler, K.
Permeability of the choroid plexus of the rabbit to several solutes.
Am. J. Physiol. 210(3): 652-60, '66

III. CARBOHYDRATES & RELATED COMPOUNDS

400. Barton, R.R.
A specific method for quantitative determination of glucose.
Anal. Biochem. 14(2): 258-60, '66

401. Chowers, I., et al.
Effect of insulin administered intracisternally on the glucose level of the blood and the cerebrospinal fluid in vagotomized dogs.
Exp. Neurol. 14(3): 383, '66

402. Greenwood, F.C., et al.
The plasma sugar, free fatty acid, cortisol, and growth hormone response to insulin. I. In control subjects.
J. Clin. Invest. 45(4): 429-36, '66

403. Raggi, F. & Kronfeld, D.S.
Higher glucose affinity of hexokinase in sheep brain than in rat brain.
Nature 209(5030): 1353-4, '66

404. Satoh, T. & Iwamoto, T.
Neurotropic, electroschok, and carbohydrate metabolism in the rat.
Biochem. Pharmacol. 15(3): 323, '66

405. Sherman, W.R. & Stewart, M.A.
Identification of sorbitol in mammalian nerve.
Biochem. Biophys. Res. Commun. 22(5): 492-7, '66

406. Smith, M. E.
Glucose metabolism of central nervous tissues in rats with experimental allergic encephalomyelitis.
Nature. 209(5027): 1031-2 '66

407. Stewart, M.A., et al.
Free sugars in alloxan diabetic rat nerve.
Biochem. Biophys. Res. Commun. 22(5): 488-91, '66

IV. AMINO ACIDS, REPTIDES & RELATED COMPOUNDS

408. Appeltauer, G.S.L. & Saá, E.A.A.
Incorporation of C-14 lysine into spinal roots, spinal ganglia, and peripheral nerves of the rat.
Exp. Neurol. 14(4): 484-95, '66

409. Bremer, H.J. & Neumann, W.
Tolerance of phenylalanine after intravenous administration in phenylketonurics, heterozygous carriers, and normal adults.
Nature 209(5028): 1148-9, '66

410. Carnegie, P.R. & Lumsden, C.E.
Encephalitogenic peptides from spinal cord.
Nature. 209(5030): 1354-5, '66

411. Cazzullo, C. L., et al.
Tryptophan metabolism in affective psychoses.
Brit. J. Psychiat. 112(483): 157-62, '66

412. Gaetjens, E. & Bárány, M.
N-acetylaspartic acid in G-actin.
Biochim. Biophys. Acta. 117(1): 176-83, '66

413. Kramer, S.Z. & Seifter, J.
The effects of GABA and biogenic amines on behaviour and brain electrical activity in chicks.

Life Sci. 5(6): 527-34, '66

414. Kuriyama, K., et al.
Elevation of γ-aminobutyric acid in brain with amino-oxyacetic acid and susceptibility to convulsive seizures in mice: A quantitative re-evaluation.
Biochem. Pharmacol. 15(3): 221, '66

415. Kuriyama, K., et al.
The γ-aminobutyric acid system in rabbit cerebellum.
Proc. Nat. Acad. Sci. U.S.A. 55(4): 846-52, '66

416. Lewis, G.P. & Reit, E.
Further studies on the actions of peptides on the superior cervical ganglion and suprarenal medulla.
Brit. J. Pharmacol. 26(2): 444-60, '66

417. Lumsden, C.E., et al.
Chemical studies on experimental allergic encephalomyelitis. Peptide as the common denominator in all encephalitogenic 'antigens'.
J. Neurochem. 13(3): 127-62, '66

418. Sellinger, O. Z. & Garaza, A.
The inhibition of cerebral glutamine synthetase by structural analogs of the convulsant dl-methionine sulfoximine.
Biochem. Pharmacol. 15(3): 396, '66

419. Shimizu, H., et al.
A method of determination of cystathionine and its distribution in humna brain.
J. Neurochem. 13(2): 65-73, '66

420. Takeuchi, A. & Takeuchi, N.
A study of the inhibitory action of γ-aminobutyric acid on neuromuscular transmission in the crayfish.
J. Physiol. 183(2): 418, '66

421. Takeuchi, A. & Takeuchi, N.
On the permeability of the presynaptic terminal of the crayfish neuromuscular junction during synaptic inhibition and the action of γ-aminobutyric acid.
J. Physiol. 183(2): 433, '66

422. Wiechert, P. & Herbst, A.
Provocation of cerebral seizures by derangement of the natural ba-

lance between glutamic acid and γ-aminobutyric acid.
J. Neurochem. 13(2): 59-64, '66

V. PROTEINS

423. Campbell, M. K., et al.
Protein synthesis systems from rat brain.
Biochemistry 5(4): 1174, '66

424. Sky-Peck, H. H., et al.
Incorporation of glucose into the proteinbound amino acids of one-day-old mouse brain in vitro.
J. Neurochem. 13(4): 223, '66

425. Stenzel, K. H., et al.
In vitro synthesis of brain protein. II. Properties of the complete system.
Biochemistry 5(3): 930, '66

426. Talwar, G. P., et al.
Correlation of the functional activity of the brain with metabolic parameters - III. Protein metabolism of the occipital cortex in relation to light stimulus.
J. Neurochem. 13(2): 109-16, '66

VI. NUCLEIC ACIDS & RELATED COMPOUNDS

427. Cohen, H. D. & Barondes, S. H.
Further studies of learning and memory after intracerebral actinomycin-D.
J. Neurochem. 13(4): 207, '66

428. Kogan, A. B. & Zakuskin, S. L.
Correlated changes in ribonucleic acid and electrical activity for crayfish single stretch receptor neurons during excitation and inhibition.
Federation Proc. 25(2) pt. 2: T191-5, '66

VII. LIPIDS, STEROIDS & RELATED COMPOUNDS

429. Berry, J. F. & Cevallos, W. H.
Lipid class and fatty acid composition of peripheral nerve from normal and organophosphorus-poisoned chickens.

J. Neurochem. 13(2): 117-24, '66

430. Creese, R. & Taylor, D.B.
Labelled carbamylcholine in brain slices of the rat.
J. Physiol. 183(2): 68p, '66

431. Davies, W.E., et al.
Decarboxylation of 2-keto fatty acids by brain.
J. Lipid Res. 7(2): 270-6, '66

432. Davison, A.N. & Gregson, N.A.
Metabolism of cellular membrane sulpholipids in the rat brain.
Biochem. J. 98(3): 915-22, '66

433. Feigin, I. & Popoff, N.
Regeneration of myelin in multiple sclerosis: The role of mesenchymal cells in such regeneration and in myelin formation in peripheral nervous system.
Neurology 16(4): 364, '66

434. Hokin, L.E.
Effects of acetylcholine on the incorporation of ^{32}P into various phospholipides in slices of normal and denervated superior cervical ganglia of the cat.
J. Neurochem. 13(3): 179-84, '66

435. Kreps, E.M., et al.
Phospholipids in subcellular fractions of chicken brain during ontogenesis.
Federation Proc. 25(2) pt. 2: T277-82, '66

436. Mokrasch, L. C.
Incorporation of [^{14}C] amino acids into the proteolipid of subcellular preparations of rat brain in vivo.
J. Neurochem. 13(2): 49-58, '66

437. Norton, W.T. & Autilio, L.A.
The lipid composition of purified bovine brain myelin.
J. Neurochem. 13(4): 213, '66

438. Penick, R.J., et al.
Thin-layer chromatographic studies of human brain gangliosides. (BBA 55204)
Biochim. Biophys. Acta 116(2): 279-87, '66

439. Porges, E. & Soják, L.

Sphingomyeline, Cerebroside und Sulphatide im Neugeborengehirn.
J. Neurochem. 13(3): 169-72, '66

440. Rose, M.S. & Aldridge, W.N.
Triethyltin and the incorporation of [^{32}P] phosphate into rat brain phospholipids.
J. Neurochem. 13(2): 103-8, '66

441. Schwartz, M., et al.
Mood, motility and 17-hydroxycorticoid excretion: A polyvariable case study.
Brit. J. Psychiat. 112(483): 149-56, '66

442. Slusher, M.A.
Effects of cortisol implants in the brainstem and ventral hippocampus on diurnal corticosteroid levels.
Exp. Brain Res. 1(2): 184-94, '66

443. Snyder, S.H. & Reivich, M.
Regional localization of lysergic acid diethylamide in monkey brain.
Nature 209(5028): 1093-5, '66

444. Tucek, S.
The synthesis of acetyl-coenzyme A and acetylcholine from citrate and acetate in the nerve endings of mammalian brain. (BBA 21129)
Biochim. Biophys. Acta. 117(1): 278-80, '66

445. Van Alten, P.J. & La Velle, A.
Antigenic changes in developing hamster brain using antisera to myelinated and unmyelinated brain.
Exp. Neurol. 14(2): 115-33, '66

446. Weitzman, E.D., et al.
Plasma 17-hydroxycorticosteroid levels during sleep in man.
J. Clin. Endocrinol. Metab. 26(2): 121-7, '66

VIII. BIOGENIC AMINES

447. Andén, N.-E., et al.
Effects of tyrosine hydroxylase inhibition on the amine levels of central monoamine neurons.
Life Sci. 5(6): 561-8, '66

448. Banks, P. & Blascho, H.

Chromaffin tissue.
Pharmacol. Rev. 18(1) pt. 1: 453-6, '66

449. Bertler, A., et al.
The localization of monoaminergic blood-brain barrier mechanisms.
Pharmacol. Rev. 18(1) pt. 1: 369-85, '66

450. Bertler, A. & Rosengren, E.
Possible role of brain dopamine.
Pharmacol. Rev. 18(1) pt. 1: 769-73, '66

451. Biscoe, T. J. & Curtis, D. R.
Noradrenaline and inhibition of Renshaw cells.
Science 151(3715): 1230-31, '66

452. Boullin, D. J.
Effect of divalent ions on release of ^{3}H-noradrenaline by sympathetic nerve stimulation.
J. Physiol. 183(2): 76P, '66

453. Burnstock, G., & Holman, M. E.
Junction potentials at adrenergic synapses.
Pharmacol. Rev. 18(1) pt. 1: 481-93, '66

454. Campbell, T. L.
New light on how certain amines act in the brain.
Science 152(3719): 232-8, '66

455. Carlsson, A.
Pharmacological depletion of catecholamine stores.
Pharmacol. Rev. 18(1) pt. 1: 541-9, '66

456. Cooper, T.
Surgical sympathectomy and adrenergic function.
Pharmacol. Rev. 18(1) pt. 1: 611-18, '66

457. Costa, E., et al.
Interactions of drugs with adrenergic neurons.
Pharmacol. Rev. 18(1) p5. 1: 577-97, '66

458. Curran, D. A., et al.
Total plasma serotonin, 5-hydroxyindole-acetic acid and p-hydroxy-m-methoxy-mandelic acid excretion in normal and migrainous subjects.
Brain 88(5): 997-1010, '65

459. Eccleston, D., et al.
Some observations on the estimation of tryptamine in tissues.
J. Neurochem. 13(2): 93-101, '66

460. El-Hawary, M. B. E. & Feldferg, W.
Perfusion of 5-hydroxytryptophan through the third cerebral ventricle of anaesthetized cats. Effect on 5-hydroxytryptamine output and body temperature.
J. Physiol. 183(1): 26p, '66

461. Ershova, V. P.
Comparative cytochemical study of sympathetic neurons in thoracic portion of lateral sympathetic trunk in vertebrates.
Federation Proc. 25(2) pt. 2: T196-200, '66

462. Feldberg, W., et al.
Effects on temperature of monoamines injected into the cerebral ventricles of dog. (title only)
J. Physiol. 183(2): 70P, '66

463. Gatfield, P. D., et al.
Regional energy reserves in mouse brain and changes with ischaemia and anaesthesia.
J. Neurochem. 13(3): 185-95, '66

464. Gessa, G. L., et al.
Interaction of demethylimipramine (DMI) with the adrenergic and NE releasing actions of tyramine, α-methyl-m-tyramine, and metaraminol.
Life Sci. 5(6): 501-7, '66

465. Gilbert, G. J. & Armstrong, E. P.
The effect of epinephrine upon subcommissural organ secretion in the rat.
Neurology 16(3): 236-41, '66

466. Glowinski, J. & Axelrod, J.
Effects of drugs on the disposition of H^3-norepinephrine in the rat brain.
Pharmacol. Rev. 18(1) pt. 1: 775-85, '66

467. Glowinski, J., et al.
Storage and synthesis of norepinephrine in the reserpine-treated rat brain.
J. Pharmacol. Exp. Therap. 151(3): 385-99, '66

468. Hillarp, N., et al.
Demonstration and mapping of central neurons containing dopamine, noradrenaline, and 5-hydroxytryplamine and their relations to psychopharmaca.
Pharmacol. Rev. 18(1) pt. 1: 727-41, '66

469. Kety, S.S.
Catecholamines in neuropsychiatric states.
Pharmacol. Rev. 18(1) pt. 1: 787-98, '66

470. Kopin, I.J.
Biochemical aspects of release of norepinephrine and other amines from sympathetic nerve endings.
Pharmacol. Rev. 18(1) pt. 1: 513-23, '66

471. Kremzner, L.T. & Pfeiffer, C.C.
Identification of substances interfering with the fluorometric determination of brain histamine.
Biochem. Pharmacol. 15(2): 197-200, '66

472. Ledebur, I.X. & Tissot, R.
Modification de l'activité électrique cérébrale du lapin sous l'effect de micro-injections de précurseurs des monoamines dans les structures sommogènes bulbaires et pontiques.
Electroencephalog. Clin. Neurophysiol. 20(4): 370, '66

473. Levi-Montalcini, R. & Angeletti, P.U.
Immunosympathectomy.
Pharmacol. Rev. 18(1) pt. 1: 619-28, '66

474. Lichtensteiger, W. & Langemann, H.
Uptake of exogenous catecholamines by monoamine-containing neurons of the central nervous system: Uptake of catecholamines by arcuato-infundibular neurons.
J. Pharmacol. Exp. Therap. 151(3): 400-8, '66

475. Lin, S. & Cohen, M.M.
Influence of creatine and ethanolamine on the phosphate metabolism of rabbit cerebral cortex slices in vitro.
J. Neurochem. 13(2): 85-92, '66

476. Marley, E.
Behavioural and electrophysiological effects of catecholamines.
Pharmacol. Rev. 18(1) pt. 1: 753-68, '66

477. Moran, N. C.
Pharmacological characterization of adrenergic receptors.
Pharmacol. Rev. 18(1) pt. 1: 503-12, '66

478. Muscholl, E.
Indirectly acting sympathomimetic amines.
Pharmacol. Rev. 18(1) pt. 1: 551-9, '66

479. Norberg, K. & Sjöqvist, F.
New possibilities for adrenergic modulation of ganglionic transmission.
Pharmacol. Rev. 18(1) pt. 1: 743-51, '66

480. Potter, L. T.
Storage of norepinephrine in sympathetic nerves.
Pharmacol. Rev. 18(1) pt. 1: 439-51, '66

481. Robertis, E. De.
Adrenergic endings and vesicles isolated from brain.
Pharmacol. Rev. 18(1) pt. 1: 413-24, '66

482. Salmoiraghi, G. C.
Central adrenergic synapses.
Pharmacol. Rev. 18(1) pt. 1: 717-26, '66

483. Schümann, H.
Medullary particles.
Pharmacol. Rev. 18(1) pt. 1: 433-8, '66

484. Second Symposium on Catecholamines., Milano. July, 1965.
Pharmacol. Rev. 18(1) pt. 1: 1-803, '66

485. Shore, P. A.
The mechanism of norepinephrine depletion by reserpine, metaraminol and related agents. The role of monoamine oxidase.
Pharmacol. Rev. 18(1) p5. 1: 561-8, '66

486. Sikdar, K. & Ghosh, J. J.
Effect of dramamine on Deiter's nerve cells of rats following vestibular stimulation.
J. Neurochem. 13(3): 205-6, '66

487. Sjaastad, O.
The urinary excretion of histamine in patients with multiple sclerosis.
Acta Neurol. Scand. 42(1): 118-23, '66

488. Spector, S.
Inhibitors of endogenous catecholamine biosynthesis.
Pharmacol. Rev. 18(1) pt. 1: 599-609, '66

489. Stjärne, L.
Storage particles in noradrenergic tissues.
Pharmacol. Rev. 18(1) pt. 1: 425-32, '66

490. Stone, C. A. & Porter, C. C.
Methyldopa and adrenergic nerve function.
Pharmacol. Rev. 18(1) pt. 1: 569-75, '66

491. Titus, E. & Dengler, H. J.
The mechanism of uptake of norepinephrine.
Pharmacol. Rev. 18(1) pt. 1: 525-35, '66

492. Trendelenburg, U.
Mechanisms of supersensitivity and subsensitivity to sympathomimetic amines.
Pharmacol. Rev. 18(1) pt. 1: 629-40, '66

493. Varagić, V. & Krastić, M.
Adrenergic activation by anticholinesterases.
Pharmacol. Rev. 18(1) pt. 1: 799-863, '66

494. White, T.
Histamine and methylhistamine in cat brain and other tissues.
Brit. J. Pharmacol. 26(2): 494-501, '66

495. Whittaker, V. P.
Catecholamine storage particles in the central nervous system.
Pharmacol. Rev. 18(1) pt. 1: 401-12, '66

496. Wood, J. G.
Electron microscopic localization of amines in central nervous tissue.
Nature. 209(5028): 1131-3, '66

IX. NEURO–& PSYCHOTROPIC DRUGS

497. Boura, A. L. A. & Fitzgerald, A. E.
The pharmacology of N-(cyclopropxylmethyl)-19-isopentylnororvinol hydrochloride. A potent and long lasting central depressant.
Brit. J. Pharmacol. 26(2): 307-21, '66

498. Comis, S. D. & Whitfield, I. C.

The effect of acetyl choline on neurones of the cochlear nucleus.
J. Physiol. 183(1): 22P, '66

499. Connor, J.D., et al.
Characteristics of tremor in cats following injections of carbachol into the caudate nucleus.
Exp. Neurol. 14(3): 371, '66

500. Curtis, D.R. & Ryall, R.W.
Pharmacological studies upon spinal presynaptic fibres.
Exp. Brain Res. 1(2): 195-204, '66

501. Dawes, C.
The composition of human saliva secreted in response to a gustatory stimulus and to pilocarpine.
J. Physiol. 183(2): 360, '66

502. Driever, W., et al.
Stress stimulation of drug metabolism in the rat.
Intern. J. Neuropharmacol. 5(2): 199-205, '66

503. Ellaway, P.H. & Pascoe, J.E.
Blockage of a spinal pathway by chlorpromazine.
J. Physiol. 183(1): 46P, '66

504. Ellinwood, E.H. jun.
Paradoxical effect of dichloroisoprotereno on pentobarbital sleep time in hyperthyroi mice.
Nature 209(5029): 1250-51, '66

505. Frank, G.B. & Pinsky, C.
Tetrodotoxin-induced central nervous system depression.
Brit. J. Pharmacol. 26(2): 435-43, '66

506. Fukuyama, G.S., & Goldie, D.W.
Possible neurotoxicity of diisopropyl phosphorofluoridate in guinea-pigs.
Nature 209(5027): 1032, '66

507. Gartside, I.B., et al.
The evoked cortical somatosensory response in normal man and its modification by oral lithium carbonate.
Electroencephalog. Clin. Neurophysiol. 20(4): 382, '66

508. Gilbert, J.C., et al.

The effects of anticonvulsant drugs on the permeability of brain cells to D-xylose.
J. Neurochem. 13(4): 247, '66

509. Gonzalez, J. R.
Extreme sensitivity of phenothiazines in a psychotic patient with Pick wick syndrome.
Am. J. Psychiat. 122(9): 1060-61, '66

510. Hansebout, R. R. & Cosgrove, J. B. R.
Effects of intrathecal phenol in man: A histological study.
Neurology 16(3): 277-82, '66

511. Illis, L., et al.
Boutons terminaux and tri-orthocresyl phosphate neurotoxicity.
Exp. Neurol. 14(2): 160-74, '66

512. Iorio, L. C. & McIsaac, R. J.
Comparison of the stimulating effects of nicotine, pilocarpine and histamine on the superior cervical ganglion of the cat.
J. Pharmacol. Exp. Therap. 151(3): 430-7, '66

513. Irwin, S. & Benuazizi, A.
Pentylenetetrazol enhances memory function.
Science. 152(3718): 100-2, '66

514. Jung, O. H. & Boyd, E. S.
Effects of cholinergic drugs on self-stimulation response rates in rats.
Am. J. Physiol. 210(3): 432-4, '66

515. Korol, B., et al.
Pharmacological investigation of a new psychoactive agent.
Nature 209(5029): 1249-50, '66

516. Kosteritz, H. W. & Wallis, D. I.
The effects of hexamethonium and morphine on transmission in the superior cervical ganglion of the rabbit.
Brit. J. Pharmacol. 26(2): 334-44, '66

517. Kostowski, W. & Gumutka, W.
Actions of neostigmine and physostigmine on sympathetic ganglia in the cat.
Intern. J. Neuropharmacol. 5(2): 193-8, '66

518. Krieger, D. T., et al.

Response to dexamethasone suppression in central nervous system disease.
J. Clin. Endocrinol. Metab. 26(2): 227-30, '66

519. Kushner, T.
Experience with greater than recommended does of fluphenazine and trifluprom azine.
Am. J. Psychiat. 122(9): 1061-62, '66

520. Leonard, B.E.
The effect of the chronic administration of barbitone sodium on labile compounds in the rat brain.
Biochem. Pharmacol. 15(3): 255, '66

521. Levy, B.
The adrenergic blocking activity of N-tertbutylmethoxamine (butoxamine).
J. Pharmacol. Exp. Therap. 151(3): 413-22, '66

522. Matthews, W.B.
The action of chloroethazine on spasticity.
Brain. 88(5): 1057-64, '65

523. Nandy, K. & Bourne, G.H.
Effect of centrophenoxine on the lipofuscin pigments in the neurones of senile guineapigs.
Nature 210(5033): 313, '66

524. Politoff, A. & Macri, F.
Pharmacologic differences between isolated, perfused arteries of the choroid plexus and of the brain parenchyma.
Intern. J. Neuropharmacol. 5(2): 155-62, '66

525. Randrup, A. & Munkvad, I.
Changes in urine volume and diurnal rhythm caused by reserpine treatment of schizophrenic patients.
Brit. J. Psychiat. 112(483): 173-6, '66

526. Saelens, J.K. & Rosenblum, I.
The anticonvulsant activity of triethylcholine in cats.
Exp. Neurol. 14(4): 422-8, '66

527. Sampson, S.R.
Mechanism of coniine-blockade of postsynaptic inhibition in the spinal cord of the cat.

Intern. J. Neuropharmacol. 5(2): 171-82, '66

528. Slusher, M.A., et al.
Effect of intracerebral hydrocortisone on unit activity of diencephalon and midbrain in cats.
J. Neurophysiol. 29(2): 157-69, '66

529. Stickel, L.F., et al.
Residues of D.D.T. in brains and bodies of birds that died on dosage and in survivors.
Science 151(3717): 1549-51, '66

530. Turner, O.A., et al.
Intrathecal sodium diatrizoate: Report of a case complicated by acute renal failure and review of the literature.
Neurology. 16(3): 230-5, '66

531. Ungar, G. & Cohen, M.
Induction of morphine tolerance by material extracted from brain of tolerant animals.
Intern. J. Neuropharmacol. 5(2): 183-92, '66

532. Villiers, J. C. de
Intracranial haemorrhage in patients treated with monoamineoxidase inhibitors.
Brit. J. Psychiat. 112(483): 109-18, '66

533. White, R.P., et al.
Acute ergotropic response induced by reserpine and mephentermine.
Intern. J. Neuropharmacol. 5(2): 143-54, '66

X. SUBCELLULAR UNITS

534. Tucek, S.
Acetylcoenzyme A and acetylcholine formation from acetate and citrate in subcellular fractions of caudate nuclei and whole brains.
J. Physiol. 183(2): 71P, '66

XI. ENZYMES & COFACTORS

535. Barder, H., et al.
Isolation and characterization of a phosphorylated intermediate in the $(Na^{+}+K^{+})$ system-dependent ATPase. (BBA 65384)

Biochim. Biophys. Acta. 118(1): 106-15, '66

536. Bader, H. & Sen, A. K.
(K^+)-dependent acyl phosphatase as part of the ($Na^+ + K^+$) - dependent ATPase of cell membranes. (BBA 65388)
Biochim. Biophys. Acta 118(1): 116-23, '66

537. Berl, S.
Glutamin synthetase. Determination of its distribution in brain during development.
Biochemistry. 5(3): 916, '66

538. Bonavita, V. & Guarneri, R.
NAD- and NADP- linked dehydrogenases in the sciatic nerve of rats injected with di-isopropylfluorophosphate.
Brain Res. 1(2): 200-7, '66

539. Canessa, M.
Properties of ATP-ase activities of membrane fractions from the sheath of squid giant axons.
J. Cell. Comp. Physiol. 66(3) pt. 2: 165-8, '65

540. Ecobichon, D. J.
Properties and classification of the soluble esterases of human brain.
Can. J. Physiol. Pharmacol. 44(2): 225-32, '66

541. Finkelstein, J. D., et al.
Deficiencies of cystathionase and homoserine dehydratase activities in cystathioninuria.
Proc. Nat. Acad. Sci. U.S.A. 55(4): 865-72, '66

542. Friede, R. L.
A quantitative mapping of alkaline phosphatase in the brain of the rhesus monkey.
J. Neurochem. 13(3): 197-203, '66

543. Gatt, S. & Rapport, M. M.
Isolation of β-galactosidase and β-glucosidase from brain.
Biochim. Biophys. Acta. 113(3): 567-76, '66

544. Hamberger, A., et al.
Enzyme changes in neurons and glia during barbiturate sleep.
Science 151(3716): 1394-5, '66

545. Härkönen, M., et al.

Monoamine oxidase activity in the peripheral nerve myelin.
J. Neurochem. 13(4): 269, '66

546. Hiroshige, T., et al.
Acid phosphatase activity of the rat pituitary and hypothalamus in relation to secretory activity.
Jap. J. Physiol. 16(1): 94-102, '66

547. Hiroshige, T., et al.
Heterogeneity of acid phosphatase in the anterior pituitary and hypothalamus of the rat.
Jap. J. Physiol. 16(1): 103-12, '66

548. Hokin, L.E., et al.
Alkylation of a brain transport adenosinetriphosphatase at the cardiotonic steroid site by strophanthidin-3-haloacetates.
Proc. Nat. Acad. Sci. U.S.A. 55(4): 797-804, '66

549. Joó, F. & Csillik, B.
Topographic correlation between the hemato-encephalic barrier and the cholinesterase activity of brain capillaries.
Exp. Brain Res. 1(2): 147-51, '66

550. Maletta, G.J. & Timiras, P.S.
Acetyl- and butyrylcholinesterase activity of selected brain areas in developing rats after neonatal X-irradiation.
J. Neurochem. 13(2): 75-84, '66

551. McCaman, R.E., et al.
Carnitine acetyltranferase in nervous tissue.
J. Biol. Chem. 241(4): 930-4, '66

552. Milosevic, M.P. & Andjelkovic.
Reactivation of paraoxon-inactivated cholinesterase in the rat cerebral cortex by pralidoxime chloride.
Nature. 210(5032): 206, '66

553. Neims, A.H., et al.
Distribution of D-amino acid oxidase in bovine and human nervous tissues.
J. Neurochem. 13(3): 163-8, '66

554. Rymenant, M. van., et al.
Isocitric dehydrogenase in the cerebrospinal fluid: Clinical usefulness of its determination.

Neurology. 16(4): 351-4, '66

555. Saraswathi, S. & Bachhawat, B. K.
Heterogeneity of alkaline phosphatase in sheep brain.
J. Neurochem. 13(4): 237, '66

556. Swanson, P. D.
Temperature dependence of sodium ion activation of the cerebral microsomal adenosine triphosphatase.
J. Neurochem. 13(4): 229, '66

XII. METABOLISM

557. Dunn, H. G., et al.
Homocystinuria: A recently discovered cause of mental defect and cerebrovascular thrombosis.
Neurology 16(4): 407, '66

DEVELOPING BRAIN

No. 15 June, 1966

We are, in this newsletter, attempting to change the citation form of references in the hope that the reference to the CURRENT CONTENTS number will aid you in sending for reprints. An additional sheet of references in the old style is included in order to clear the books. It is possible that about twice a year it may be necessary to use an additional sheet to list the reprints many of you are kind enough to send me and which I have somehow missed in browsing.

****

CURRENT CONTENTS: 9: April 5, 1966

Lee, Cheng-Chun Comparative pharmacologic responses to antihistamines in newborn and young rats. Toxicol. Appl. Pharmacol., 8: 210-217, 1966

CURRENT CONTENTS: 9: May 3, 1966.

Finkelstein, J. D., Mudd, S. H., Irreverre, F. and Laster, L. Biochemistry--Deficiencies of cystathionase and homoserine dehydratase activities in cystathioninuria. Proc. Natl. Acad. Sci., 55: 865, 1966. Kovacic, B. and Robinson, R. L. The effect of reserpine on catecholamine levels in the gravid rat and its offspring. J. Pharm. Exp. Therap., 152: 37, 1966. Sky-Peck, H. H., Rosenbloom, C. and Winzler, R. J. Incorporation of glucose into the protein-bound amino acids of one-day-old mouse brain in vitro. J. Neurochem., 13: 223, 1966. Corliss, C. E., Fedinec, A. A. and Robertson, G. G. The teratogenic effect of tetanus toxin on the central nervous system of the early chick embryo. Anat. Rec., 154: 221, 1966. Woodruff, C. Nutritional aspects of growth and development. J. Am. Med. Assoc., 196: 214, 1966. Schreiber, V. and Kmentová, V. Thyroxine in

the early postnatal period: minimal changes in thyroid function. Neuroendoc., 1: 121, 1965-66.

CURRENT CONTENTS, 9: May 17, 1966.

Perry, T. L., et al. Homocystinuria: excretion of a new sulfur-containing amino acid in urine. Science, 152: 776, 1966. Menolascino, F. J. The facade of mental retardation: its challenge to child psychiatry. Am. J. Psychiat., 122: 1227, 1966. Goodlin, R. C. Fetal incubator studies. III. Factors associated with breathing in fetal rabbits. Biol. Neonat., 8: 274, 1966. Monod, N. and Pajot, N. The sleep of the full-term newborn and premature infant. I. Analysis of the polygraphic study (rapid eye movements, respiration and E.E.G.) in the full-term newborn. Biol. Neonat., 8: 281, 1966 Payne, G. S. and Bach, L. M. N. Perinatal sleep-wake cycles. Biol. Neonat., 8: 308, 1966. Odor, D. L., Pearce, L. A. and Janeway, R. Juvenile amaurotic idiocy. An electron microscopic study. Neurology, 16: 496, 1966.

CURRENT CONTENTS, 9: May 24, 1966

Kristensson, K. and Sourander, P. Occurrence of lipofuscin in inherited metabolic disorders affecting the nervous system. J. Neurol. Neurosurg. Psychiat., 29: 113, 1966. Booth, D. A., Goodwin, H. and Cumings, J. N. Abnormal gangliosides in Tay-Sachs disease, Niemann-pick's disease and gargoylism. J. Lipid Res., 7: 337, 1966. Sontag, L. W. Implications of fetal-behavior and environment for adult personalities. Ann. N.Y. Acad. Sci., 134: 782, 1966.

CUTTENT CONTENTS, 9: May 31, 1966.

Barbiroli, B., Cozzani, C. and Rossoni, C. Aspects of nucleic acids metabolism during chick embryo development. Ital. J. Biochem., 14: 311, 1966. Hutchinson, T. C. A method for determining expected parturition date of rhesus monkeys (Macaca Mulatta). Lab. Animal Care, 16: 93, 1966.

****

CALLING ATTENTION TO:

"Problems of Developmental Neurophysiology and E. E. G. in Paediatrics" were the subject of a program by distinguished speakers at the Institute of Child Health, University of London on June 10-12. This meeting was arranged by Dr. G. Pampiglione, Department of Clinical Neurophysiology at the Institute.

The newsletter of CIOMS for April, 1966, summarizes the work of an international group of experts on medical terminology and medical dictionaries. The detailed proceedings of the group will be published by S. Karger of Basle. At the recommendation of this group the CIOMS has established an International Clearing House for Medical Terminology.

Grants, Fellowships and Awards: The University of Colorado's recently established Institute for Developmental Biology will accept its first doctoral students this fall, for work with primary emphasis on heredity, developmental biology, cellular biology, or biochemistry. A limited number of stipends are available for students with bachelors degrees in biological or physical sciences. In addition, opportunities are available for postdoctoral fellows, research associates, and visiting professors. Information may be obtained from the Institute, University of Colorado Graduate School, Boulder, Colorado-80302.

****

ADDRESS CHANGE:

From: Dr. Max Fink - - formerly at University of Missouri, St. Lou Louis, Missouri,

now:

Professor of Psychiatry
Department of Psychiatry
New York Medical College
106th and Fifth Avenue
New York, New York - 10029

****

(1) Jewett, R. E. and Norton, S. Effect of tranquilizing drugs on postnatal behavior. Exp. Neurol., 14: 33-43, 1966. (2) Copenhaver, J. H., Carver, M. J. and Schain, R. J. Effects of folic and folinic acids on the metabolism of phenylalanine in phenylketonuria. Metabolism, 14: 1233-1236, 1965. (3) Bennett, D. S. and Giarman, N. J. Schedule of appearance of 5-hydroxytryptamine (serotonin) and associated enzymes in the developing rat brain. J. Neurochem., 12: 911-918, 1965. (4) Ferngren, H. Pentetrazol induced seizures and their antagonism by barbiturates in newborn and young mice. Acta pharmacol. et toxicol., 23: 27-35, 1965. (5) Gibson, J. B., Carson, N. A. J. and Neill, D. W. Pathological findings in homocystinuria. J. clin. path., 17: 427-437, 1964. (6) Zarrow, M. X., Denenberg, V. H. and Anderson, C. O. Rabbit: frequency of suckling in the pup. Science, 150: 1835-1836, 1965. (7) Berry, M. and Rogers, A. W. The migration of neuroblasts in the developing cerebral cortex. J. Anat., 99: 691-709, 1965. (8) Aprison, M. H. and Hingtgen, J. N. Neurochemical correlates of behavior--IV. Norepinephrine and dopamine in four brain parts of the pigeon during period of atypical behavior following the injection of 5-hydroxytryptophan. J. Neurochem., 12: 959-968, 1965. (9) Eguchi, Y. and Wells, L. J. Response of the hypothalamic-hypophyseal adrenal axis to stress: observations in fetal and caesarean newborn rats. Proc. Soc. Exp. Biol. Med., 120: 675-678, 1965. (10) Reinis, S. Contribution to the problem of the regeneration of nerve fibres in the central nervous system after operative damage in the early postnatal period. Acta anat., 60: 165-180, 1965.

(11) Vernadakis, A. and Woodbury, D. M. Effects of diphenylhydantoin on electroshock seizure thresholds in developing rats. J. Pharmacol. Exp. Therap., 148: 144-150, 1965. (12) Melzack, R. Effects of early experience on behavior: experimental and conceptual considerations. In Psychopathology of Perception. P. H. Hock and J. Zubin, Eds., Grune & Stratton, New York, pgs. 271-299, 1965. (13) Melzack, R. and Burns, S. K.

Neurophysiological effects of early sensory restriction. Exp. Neurol., 13: 163-175, 1965. (14) Rosenberg, A. and Stern, N. Changes in sphingosine and fatty acid components of the gangliosides in developing rat and human brain. J. Lipid Res., 7: 122-131, 1966. (15) Wiesel, T. N. and Hubel, D. H. Comparison of the effects of unilateral and bilateral eye closure on cortical unit responses in kitten. J. Neurophysiol., 28: 1029-1040, 1965. (16) Hubel, D. H. and Wiesel, T. N. Binocular interaction in striate cortex of kittens reared with artificial squint. J. Neurophysiol., 28: 1041-1059, 1965. (17) Wiesel, T. N. and Hubel, D. H. Extent of recovery from the effects of visual deprivation in kittens. J. Neurophysiol., 28: 1060-1072, 1965. (18) Streicher, E., Wisniewski, H., and Klatzo, I. Resistance of immature brain to experimental cerebral edema. Neurology, 15: 833-836, 1965. (19) Amore, G. and Bonavita, V. Aspartate aminotransferase in the brain of the developing rat. Life Sci., 4: 2417-2424, 1965. (20) Bennett, D. S. and Giarman, N. J. Schedule of appearance of 5-hydroxytryptamine (serotonin) and associated enzymes in the developing rat brain. J. Neurochem., 12: 911-918, 1965. (21) Rozdilsky, B. Kittens as experimental model for study of kernicterus. Am. J. Dis. Child., III: 161-165, 1966.

(22) Krnjevic, K. and Silver, A. Acetylcholinesterase in the developing forebrain. J. Anat., 100: 63-89, 1966. (23) Brennan, W. M., Ames, E. W. and Moore, R. W. Age differences in infants' attention to patterns of different complexities. Science, 151: 354-356, 1966. (24) Eichengreen, J. M., Coren, S. and Nachmias, J. Visual-cliff preference by infant rats: effects of rearing and test conditions. Science, 151: 830-831, 1966. (25) Laget, P. and Delhaye-Bouchaud, N. and Thomson, M. A. Evolution des rèponses recrutantes d'origines diverses au cours de la maturation. J. Physiol., 57: 641, 1965. (26) Thomson, M. A. Developpement des activitès hippocampiques spontanèes et provoquèes chez le jeune Lapin. J. Physiol., Paris, 57: 710, 1965. (27) Nèverlèe, H. and Laget, P. Pro-

pagation de la "depression envahissante" (spreading depression) et maturation corticale règinale chez le jeune Lapin. Comptes Rend. Soc. Biol., 159: 1332, 1965. (28) Delhaye-Bouchaud, N. and Laget, P. Maturation des responses evoquees cèrebelleuses, somatiques et visuelles au cours du developpement chez le jeune Lapin. Compt. Rend. Soc. Biol., 159: 1327, 1965. (29) Laget, P., Delhaye-Bouchaud, N. and Thomson, M. A. Maturation règinale et signes des rèponses èvoquèes corticales chez le jeune Lapin. Compt. Rend. Soc. Biol., 159: 1291, 1965. (30) Pritchard, E. T. In vivo labelling of sulphatides from (^{35}S) sulphate in rat brain during early growth. J. Neurochem., 13: 13-21, 1966.
(31) Johnson, D. and Roofe, P. G. Blood constituents of normal newborn rats and those exposed to low oxygen tension during gestation; weight of newborn and litter size also considered. Anat. Rec., 153: 303-310, 1965.
(32) Nyström, B. and Skoglund, S. Neuro-muscular transmission in the kitten. Acta Soc. Med. Upsal., 70: 225-228, 1965. (33) Davis, J. A. and Stafford, A. Respiratory distress in newborn rabbits. Biol. Neonat., 7: 129-140, 1964. (34) Krnjevic, K. and Silver, A. Acetylcholinesterase in the developing forebrain. J. Anat., 100: 63-89, 1966. (35) Garma, L. and Verley, R. Gènèrateurs corticaux ètudiès par èlectrodes implantèes chez le Lapin nouveau-nè. J. Physiol., 57: 811-818, 1965. (36) Verley, R. Recherches sur le dèveloppement des activitès èlectro-corticales avec des èlectrodes corticales radiaires. J. Physiol., 57: 407-436, 1965.
(37) Sedlácek, J. and Macek, O. D. C. potential and high frequency impedance of the cerebral hemispheres in guinea-pig fetuses in the perinatal period. Physiologia Bohemoslovenica, 14: 371-378, 1965. (38) Murphree, O. D. and Dykman, R. A. Litter patterns in the offspring of nervous and stable dogs. I: Behavioral tests[1]. J. Nerv. Ment. Dis., 141: 321-332, 1965. (39) Bargeton-Farkas, E. and Pearse, A. G. E. Aspects histo-enzymologiques de la maturation du systeme nerveux. J. Neurolog. Sci., 2: 213-240, 1965. (40) Andersson, H. and Roos, B.-E. Acidic mono-

amine metabolites in cerebrospinal fluid of children with hydrocephalus. Acta Neurol. Scand., 41: 149-151, 1965.
(41) Amore, G. and Bonavita, V. Aspartate aminotransferase in the brain of the developing rat. Life Sci., 4: 2417-2424, 1965. (42) Joffe, J. M. Genotype and prenatal and premating stress interact to affect adult behavior in rats. Science, 150: 1844-1845, 1965. (43) Adams, D. H. The relationship between cellular nucleic acids in the developing rat cerebral cortex. Biochem. J., 98: 636-640, 1966. (44) Wainer, A., King, J. S., Jr., Goodman, H. O. and Thomas, J. J. S^{35} taurine metabolism in normal and mongoloid individuals. Proc. Soc. Exp. Biol. Med., 121: 212-216, 1966. (45) Renuart, A. W. Screening for inborn errors of metabolism associated with mental deficiency or neurologic disorders or both. New Engl. J. Med., 274: 384-387, 1966. (46) Rozdilsky, B. Kittens as experimental model for study of kernicterus. Am. J. Dis. Child., 111: 161-165, 1966. (47) Dykman, R. A., Murphree, O. D. and Ackerman, P. T. Litter patterns in the off-spring of nervous and stable dogs: II. Autonomic and motor conditioning. J. Nerv. Ment. Dis., 141: 419-431, 1966. (48) Tagher, P. and Reisman, L. E. Reproduction in Down's syndrome (mongolism): chromosomal study of mother and normal child. Obstet. Gynecol., 27: 182-184, 1966. (49) Young, R. S. and Klepinger, B. Effect of neonatal catecholamine administration on later behaviour in rats. Psychopharmacologia, 8: 445-453, 1966. (50) James, L. F., Lazar, V. A. and Binns, W. Effects of sublethal doses of certain minerals on pregnant ewes and fetal development Am. J. Vet. Res., 27:132-135, 1966.
(51) Cosnier, J., Duveau, A. and Chanel, J. Oxygen consumption and gregarous behavior in young rats. Compt. rend. soc. biol., 159: 1579-1581, 1965. (52) Peters, J., Vonderahe, A. and Schmid, D. Onset of cerebral electrical activity associated with behavioral sleep and attention in the developing chick. J. Exp. Zool., 160: 255-262, 1965. (53) King, J. S., Jr., Goodman, H. O. and Thomas, J. J. Urinary amino acid excretion in mongolism. Acta Genet. et Statist. Med., 16: 132-154, 1966.

—ニュース—

FIRST INTERNATIONAL MEETING OF THE INTERNATIONAL SOCIETY FOR NEUROCHEMISTRY

Strasbourg, France, July 23-28, 1967

The meeting is open to all interested persons, but the number of participants will have to be limited to the capacity of local facilities. Detailed information on registration fee and accomodations will be given in subsequent announcements.

Communications on original work on any aspect of neurochemistry may be submitted. Those related to the topics listed below will be especially welcome. Presentations will have to be limited to no more than 15 minutes.

General theme of the meeting: BIOCHEMICAL FACTORS CONCERNED IN THE FUNCTIONAL ACTIVITY OF THE NERVOUS SYSTEM

1. Structure and biosynthesis of membranous structures
2. Biosynthesis of RNA and proteins (this topic will be organized as a round-table discussion)
3. Biochemical changes associated with functional activity of the nervous system
4. Mechanism of transport of cations across membranes
5. Electrolyte changes affecting neuronal activity in pathological states

Those interested in presenting papers should submit abstracts of no more than 300 words to one of the secretaries before January 31, 1967, preferably in English. The program committee will select the papers to be included in the final program.

Communications may be presented in English, French, German or Russian.

Dr. J. Folch-Pi
McLean Hospital
Belmont, Mass. 02178
U. S. A.

Dr. P. Mandel
C.N.R.S.
Centre de Neurochimie
Faculte de Medecine
Strasbourg, France

Dr. D. Richter
Medical Research Council
Laboratories
Woodmansterne Road
Carshalton, Surrey
England

第9回神経化学懇話会会場の変更

本年度の第9回神経化学懇話会（10月7日，8日）は下記の会場で行われることに変更となりましたから，ご注意下さい。合場の道案内略図はプログラムに記載されます。

北　御　堂　本願寺　大阪津村別院1階講堂
大阪市東区本町4の27（Tel. 261－6796, 3489）
御堂筋地下鉄本町下車

—神経化学研究施設の紹介(5)—

Instituto de Anatomia General y Embriologia

INSTITUTO DE ANATOMIA GENERAL Y EMBRIOLOGIA は日本で言う医学部解剖学教室に相当し，アルゼンチンに於ける6年間の医学教育（一般教養課程は特に設けていない）の一学年目の学生の講義と実習を担当している。1957年，De. Robertisの教授就任以来一貫してNeurobiology を中心とした研究が行われているが，これは1954年に Bennet 教授との共同研究から生まれた Synaptic Vesicle の最初の記載に端を発する様に思われる。当初は神経系の微細構造を電子顕微鏡的に追究するというのが唯一のテーマであったらしく当時の発表論文は全てその方面のものばかりである。1960年頃から逐次，生化学部門，電気生理学部門，薬理学部門が追加され，構造と機能との有機的な関連を重視した System をとりつゝ現在なほ拡張の段階にある。絶えず1～2名の客員研究員が訪れ活発な共同研究を行っており，地理的に疎遠な位置を考慮すれば，特異的な存在と言えるであろう。

形態学的な研究は De Robertis, Pellegrino De Irakdi, Sambrano, Jaim Echevirry, で進められている。Neur oglia, 網膜，脳下垂体，松果体は以前に，現在は視床，視床下部がその対象となっている。特に最近は Synapsis, Neurotubulus, Neurosecretion に重点をおいているものの様である。その他，週3－4回行はれる神経終末分画の分離試料を殆ど必ず電子顕微鏡的に観察し，常に形態学的な control をとっている。固定係，切片作業係，写真係というように専門的に訓練を受けた技術員が流れ作業式に試料を処理していて能率が良い。以前に Nowinsky 教授（Texas), Saez 教授（Montevideo）もここで共同研究を行った。

細胞化学，生化学的研究は1961年神経終末分画の分離に端を発し，De Robertis自らが現在，最も力を入れている部門である。Soto, Rodrigues De Lores Arnaiz, Alberici, Azcurra, Lapetina が中心となって，活性物質の神経細胞内局在，化学的伝達との関係を課題としている。アセチルコリン，ノルアドレナリン，ドーパミン，セロトニン等の活性アミンと，その代謝に関与する酵素系の細胞内局在，及びそれらの含有顆粒の形態学的なうらずけをしらべて来た。その後，脳組織に特異的なアミノ酸（GABA. グルタミン酸など）の代謝に関与する酵素系の細胞内分布えと進み，特に Cholinergic な神経終末，non-cholinergic な神経終末の性格ずけに重点がおかれた様である。最近MSO注入によるけいれんマウスの脳から分離した non-cholinergic 終末分画に多くの終末破壊像がみられることを形態学的に観察し，これが制抑性

伝達に関する終末分画である可能性を示唆した。昨年，Sutherland 教授，Burcher 博士が滞在し Adenylate cyclase の細胞内分布を研究したが，当酵素が脳組織では特異的にヒスタミンによる活性化をうけることとも関連せしめて，ヒスタミンの分布え発展した。Heavy Microsome の細分画（しよ糖密度勾配による）で小神経終末分画（Small nerve ending）が分離され，ヒスタミンをはじめ，ノルアドレナリン，セロトニンが比較的小型の神経終末に結合型として存在するのではないかと思はれる様な Data を出している。

一方，粗ミトコンドリヤ分画の低滲透圧衝撃処理で得られる粗膜分画も同様にしよ糖の密度勾配重層遠沈により細分画され，その中にツボクラリンを特異的に結合し，又，その結合がアセチルコリンによりそ害される様な分画が存在することがわかり，cholinergic synaptic membrane 分離えの足がかりを作った。膜の特異性の1つである能動輸送とも関連せしめて，ATPase の分布についても報告をだしているが，未だ，機能的に単一な膜そのものの分離が果たされていない現在，当方面には余り関心を持ちたくない，というのが大まかな印象である。Folch の研究室から帰った Soto のグループは ganglioside とアセチルコリンとの神経終末における関連について仕事を進めているが，ganglioside がアセチルコリンの担体としての機能を有するとは考えにくい実験事実をだし Neuraminic Acid の機能，ganglioside 分布について，より一般的な視野からの再検討を行っている。

以上の様に，現在使用している材料は細胞内顆粒，特に神経終末に限局している感がある。将来この方面の研究を飛躍させるには，更に網羅的とも言えるデーターの蓄積が必要であるとの見地に立っている様に思はれる。生化学的定量法は殆ど例外なく micromethod に終始しているが，これは2年前客員研究員として訪れた McCaman (Univ. Indiana), Albers(NIH) 等の貢献に負う所が多い様である。他の方向としては Tandler, La Toree のグループが核酸の研究を行っているが，現在は極く基礎的な，むしろ Molecular Biology の様な進め方である。将来脳を材料にするための予備実験を重ねているのだそうである。

神経薬理学的な方面では Pehhegrins De lraldi, Zieher のグループが活性アミンの特に脳に限局しない分布をしらべ，含量の変化の日照時間との関係や，アミンの遊離におよぼす種種薬物の効果をみている。形態部門や生化学部門で得られる基礎的なデーターをここで応用するといった印象であるが，現在はそれほど重点的ではない。ただ種々活性物質の定量に必要な Bioassay は全て，ここで行われていて，他の部門を back up している

電気生理部門は Gerschenfeld を中心とし，Gerschenfeld 夫人，Wald, Chiarandini,

Stefani, Fisch, Pecci Saavedra, O'Flaherti 等が微小電極を使って電気生理学的方法で神経系の観察を行い，材料は下等動物から脊推動物にいたっている。種々アミノ酸，及び薬物の注入による単一神経細胞の挙動の変化，脳波を使用しての動物の Behavior の追究が行はれている。かってパリ大学の Tauc, Ascher, Noell 教授（Buffalo）等が共同実験を行っている。

発生部門として，Narbaitz, Adler, Pisano（客員研究員，イタリア），Orioli のグループが神経系に限局しないで細胞の分化に関する研究を進めているが，現在の所は，De Robertis とは独立した方向にある様に思はれるので詳しくはのべない。以前に Patte教授（Micligan 大学）がここで遺伝の研究を行ったといはれる。

将来の研究の方向については De Robertis は余り多くを語らないが，脳組織に特異な微細構造の機能的な対応ずけ（その一つの例として化学伝達現象の物質的なうらずけがあげられるが）を基本的なテーマとして進めていくものの様である。記憶などの神経系の高次活動に着手するまでには現在までの神経化学的研究が画きつづけて来た Planning map は，基礎的資料としては余りにも薄弱であること，従って当分は網羅主義的な Approach，或は生化学の脳えの応用といった Approach の方法もいたし方がないといった印象である。学会誌上では，De Rabertis と Whittaker（Cambridge, 1959年に Synapse Vesicle 分画を最初に記載した）との論争という形で，はなばなしい印象をうけるが，研究推進の面では余り問題にもしていない様である。ただ Whittaker のいう Synaptosome の命名について，－some の語意上の誤用を指適し，Synaptosome の名の使用には強く批判的である。

参考文献

(Morphorogy)

1) Internat. Rev. Neurobiol. **3** 1(1961)
2) J. Biophys. Biochem. Cytol. **4** 651 (1958)
3) Exper. Neurol. **8** 290(1963)
4) J. Biophys. Biochem. Cytol. **4** 743(1958)
5) Z. Zellforsch. **57** 572(1962)
6) Endocrinology **66** 742(1960)
7) Anat. Rec. **139** 299(1961)
8) J. Biophys. Biochem. Cytol. **10** 361(1961)
9) Internat. Rev. Cytol. **8** 61(1959)
10) Neurology **13** 758(1963)
11) Z. Zellforsch **60** 258(1963)
12) Anat. Rec. **139** 299(1961)
13) Anat. Rec. **145** 521(1963)
14) J. Biophys. Biochem. Cytol. **9** 229 (1961)

(Neurochemistry, Neuropharmacology)

1) Life Science **2** 696(1963)
2) Int. J. Neuropharmacol. **2** 231(1963)
3) J. Neurochem. **10** 225(1963)
4) Experientia **17** 122(1961)
5) J. Neurochem. **9** 23(1962)
6) Nature **194** 794(1962)
7) J. Neurochem. **9** 503(1962)
8) Life Science **2** 85(1963)
9) Science **140** 300(1963)
10) J. Neurochem. **10** 225(1963)
11) Biochem. Pharmacol. **12** 596(1963)
12) Life Science **2** 691(1963)
13) Int. J. Neuropharmacol. **2** 231(1963)
14) J. Neurochem. **11** 213(1964)
15) Life Saience **3** 589(1964)
16) Neurol. **14** 938(1964)
17) Proc. Nat. Acad. Sci. **53** 557(1965)
18) Life Science **4** 193(1965)
19) Prog. Brain. Res. **10** 389(1965)
20) J. Neurochem. **12** 287(1965)
21) J. Neurochem. **12** 927(1965)
22) Life Science **4** 1951(1965)

(Neurophysiology)

1) Experientia **19** 655(1963)
2) J. Neuropharmacol **3** 301(1964)
3) Nature **203** 415(1964)

編集委員　（ＡＢＣ順）

鳩谷　竜　　川北　幸男　　高坂　睦年　　黒川　正則
成瀬　浩　　佐野　勇　　佐藤　倚男　　高垣玄吉郎
高橋　良　　高橋　康夫　　塚田　裕三　　宇尾野公義

昭和41年6月25日　印刷　　神経化学　第5巻　第3号
昭和41年6月28日　発行
編集者　　（代表）塚田裕三
編集所　東京都新宿区信濃町35番地
慶応義塾大学医学部生理学教室　　神経化学懇話会
印刷及製本　東京都文京区後楽1丁目5番地　　中央商会
表紙印刷所　東京都北区西ケ原3丁目46番地　　杏林舎
発行所　東京都文京区曙町11番地　　緒方書店

会員外の方で本誌の希望は、実費でお頒けしますから上記の編集所宛にお申出下さい

神経化学　VOL. 5 NO.3

目　次

H. Waelsch 教授の追悼

Heinrich Waelsch 教授逝く……塚田　裕三
Waelsch 先生の訃報に接して……高垣玄吉郎
Waelsch 先生の思い出……成瀬　浩
Waelsch 先生の死去……中村　睦郎
In Memory of Heinrich Waelsch……E. Chargaff
Heinrich B. Waelsch——The Scientist……S.S. Kety
Heinrich Waelsch as Scientific Statesman
……R.S. Morison

〔神経化学文献〕
Developing Brain, No. 15 (June, 1966)

〔ニュース〕
First International Meeting of the International Society for Neurochemistry, Strasbourg, France, July 23～28, 1967
第9回神経化学懇話会会場の変更

〔神経化学研究施設の紹介〕
Instituto de Anatomia General y Embriologia, Buenos Aires……片岡　喜由

緒方書店刊