

It thus appears that there is some justification for the assumption that it must be a lipid or a lipo-protein membrane.

It has been the purpose of this address to re-emphasize the importance of the fundamental concepts introduced by Sir W. Hardy and Dr. I. Langmuir as to the structure of matter in the boundary state. I have attempted to show that there is implicitly contained in the concept of molecular orientation a whole series of properties and events for which there are no analogies in homogeneous bulk phase systems. We note that many of the modes and types of the reactions which can be effected in monolayers, and which can be defined with precision and their mechanism established with a considerable degree of assurance, are unique for such

interphases, but are again observed in living and organized material. It is with this object of ultimate correlation with biological behavior that we have taken up the detailed study of interfacial reactions at Cambridge, and I should like to express my deep indebtedness to my colleague, Dr. J. Schulman, who has been associated with me in this object.

Many "vitalistic" models have been proposed in the past, and whilst it might be correct, although unscientific, to suggest that the ultimate level of integration in living matter is incapable of examination and definition, yet I believe that one is justified in asserting that at least one of the important levels to which due attention must be given for a proper understanding of biological activities is that of the ordered interface.

## OBITUARY

### THE MAYO BROTHERS AND THEIR CLINIC

THERE was nothing mysterious or supernatural about this twentieth century Lourdes at whose doors incredible numbers of the lame, halt and blind have for years been daily delivered from the ends of the earth. Nothing supernatural—unless possibly the flawless, life-long devotion of two brothers for one another be so regarded. Not since the somewhat mythical attachment of those fifth-century physicians, Cosmos and Damian, both of whom in due time came to be sanctified, has there been anything quite like it.

Rochester, Minnesota, fifty years ago, then scarcely on the map, was a prairie town near the headwaters of the Mississippi where in a humble way, at St. Mary's Hospital, the Clinic had its beginning. It was, to be sure, a Catholic foundation in which Sisters of Mercy doubtless prayed for the recovery of their patients. But it was not primarily for prayer, however efficacious, that the afflicted as by a magnet came to be drawn to that particular shrine.

It was rather the world-wide reputation of two forward-looking men whom I like to remember as they were thirty years and more ago, young and vigorous; each blessed with rare surgical judgment, each with hands which seemed possessed, in an emergency, with an uncanny ability to do, unflustered, just the right thing at the right moment.

At this shrine there was plenty of ritual, to be sure, but it was the ritual of the well-drilled, silent, operating room where for every movement there is a reason; where the incense in the air is not to conceal corruption but to produce painless sleep; where the water in which gloved fingers are dipped is holy only because it is sterile.

Their father, the senior Dr. Mayo, pioneer and Indian fighter, was still alive when I first came to know the place in its early simplicity. There were then but two operating tables, at one of which "Dr. Will" offi-

ciated, at the other in an adjoining room "Dr. Charlie." They were thus affectionately differentiated by every one—staff, patients, employees and fellow townspeople—not to mention the countless visiting doctors who even then were wearing a path to their door.

For these also soon came from all parts of the world, often by special trains, to see for themselves what modern miracles were being performed daily in this once obscure country town. To what they could learn and carry away for their own use they were more than welcome, for our profession has no trade secrets. The more widely knowledge can be disseminated, the better for every one.

And so, as the years slipped rapidly by, a great tower of healing, known everywhere as the Mayo Clinic, was finally erected—a living memorial to a great idea, not a mere place of worship for tradition dead and gone, like the Basilica of SS. Cosmos and Damian built some fifteen centuries ago in Rome by Pope Felix IV.

Another contemporary pair of no less self-effacing brothers—Wilbur and Orville Wright of Dayton, Ohio—were also at about the same time dreaming dreams of a different sort that in no less spectacular fashion came likewise to be fulfilled. Like the Mayos, they seem to have imbibed in their youth the flavor of the old Northwest Territory where the offspring of the early settlers were reared to think more highly of serving mankind than of helping themselves.

One is led to wonder whether imaginative visions of such kind are not more likely to occur and be more possible of realization for those who live where horizons are broad than for those cooped up in metropolitan centers where, even could the rising or the setting sun ever be seen, there would be no time to stop and commune with it.

Different as W. J. and C. H. Mayo were from each other, I have always felt that there was something Lincolnesque about them both. It was shown not only

by their modesty and self-effacement, but in their shrewd appraisal of other people in whatever walk of life and in their quiet dry sense of humor. About this there was nothing boisterous, but I have known them to save with Lincoln-like readiness many an awkward situation by an appropriate story more often turned on themselves than otherwise.

Lincoln of course was pitchforked out of his native environment in the old Northwest into a position of responsibility he could not refuse. So the Mayos were ready to serve when called, as they did during the war; but they very much preferred their own countryside with its comparatively simple life despite the ever-increasing responsibilities and laborious routine of their professional work. They felt only an amused pity for those who thought they were wasting their talents in a small town and who ventured to offer them positions elsewhere of supposedly wider influence.

W. J. once said to me, "When Charlie gets so busy on his farm he forgets to have his shoes cleaned, he takes a night sleeper to Chicago knowing that he will find them well polished under his berth in the morning." Had he been encountered by some traveler on the train who with Mid-West informality asked his occupation, he would have replied, "A Minnesota farmer." Had Dr. Will been similarly asked who he was by some chance companion, he probably would have replied: "I'm C. H. Mayo's elder brother."

After Charlie's death, their friends knew the separation could not be for long. There is a tradition among surgeons that they are likely to meet their end by the same malady in the treatment of which they have themselves specialized. So it was entirely consistent that "Dr. Will" when nearly eighty should calmly submit to an operation whose difficult technique he had not only perfected but countless times had successfully carried out on persons of younger age who still survive to bless him.

The modern world is all too accustomed to gauge success in terms of net income, and thus measured the returns from the Mayo Clinic exceeded the dreams of avarice; but when in 1915 the Mayo Foundation was established Dr. Will simply stated: "We never regarded the money as ours; it came from the people and we believe, my brother and myself, that it should go back to the people."

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### RECENT DEATHS AND MEMORIALS

DR. HENRY SMITH PRITCHETT, president emeritus of the Carnegie Foundation for the Advancement of Teaching, died on August 28 at the age of eighty-two years. Before becoming president of the foundation in 1906, Dr. Pritchett had been professor of astronomy at Washington University, St. Louis; superintendent of the U. S. Coast and Geodetic Survey, and president of the Massachusetts Institute of Technology.

THE death is announced of Professor L. Lévy-Bruhl, professor of philosophy in the Sorbonne from 1899 to 1927, president of the Institut française d'Anthropologie during 1927-30, aged eighty-two years.

*The British Medical Journal* reports the death of Professor M. B. Krol, director of the clinic for nervous disorders at the All-Union Institute of Experimental Medicine. Born in 1879, Professor Krol was chief physician at the Kremlin Hospital from 1934 to 1938, and in 1935 he was chairman of the Soviet delegation to the second International Neurological Congress in London.

ON the eleventh anniversary of the death of Dr. Hideyo Noguchi, of the Rockefeller Institute for Medical Research, in Accra, West Africa, where he had gone for work with yellow fever, a memorial hall was dedicated at his birthplace in Okinajima, Japan.

## SCIENTIFIC EVENTS

### MARINE ENGINEERING AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

THE prospect of expansion in naval and merchant ship-building during the next ten years and a demand for naval engineers of exceptional qualifications has led to the establishment at the Massachusetts Institute of Technology of an advanced course in marine engineering. The course will last for one year and will lead to the degree of master of science. While it is designed primarily for graduates of Annapolis, and arranged with the cooperation of the Navy Department, it will be offered also to a group of selected civilian graduate students. It is expected that ten

experienced officers of the United States Navy will be detailed to the institute for this course and that five civilians will be admitted.

The naval building plans call for replacement of a large part of the present fleet, including battleships, cruisers, destroyers, submarines and various service ships, while the Maritime Commission is planning construction of 500 ships for the merchant marine. This program requires engineers with special training in the design and construction of marine propulsion machinery, for the major ships involved in both the Navy and merchant marine programs must be designed to give the utmost in economy of operation and reliable service. The training is designed to prepare engineers