year. Exhibit No. 2 illustrates "The Extraction of Nickel by the Mond Process," and consists of flow sheet, photographs, samples of intermediate and fine products, letterpress and booklets. Exhibit No. 3 illustrates "The Properties and Applications of Nickel and its Alloys," and consists of samples of products made in many different alloys, photographs, letterpress and booklets. Lectures illustrated by traveling exhibits or lantern slides are also given by members of the firm's staff.

DISCUSSION

PHYSIOLOGICALLY ACTIVE COMPOUNDS

IT has perhaps become customary to associate very intense biological activity chiefly with "toxines," "enzymes" and other bodies which are the despair of the organic chemist.

This attitude may have resulted partly from the fact that pharmacologists have seldom expressed the results of their experiments in striking terms. Professor A. J. Clark[1] has recently recalculated some pharmacological data in the literature and expressed the results in what may be termed an almost sensational manner. Thus he finds that doses of acetyl-choline which I had found sufficient to cause a distinct fall of blood-pressure in a cat could only produce a concentration equivalent to 1 mg in 500,000 gallons of blood. Clark has found that even smaller concentrations may affect the frog heart and shows that the volume of the cell of the frog heart is about 3.4×10^{11} times greater than that of the molecule of acetyl-choline. "This relation in size is similar to that between a large whale (100 tons) and a midge (1/3 mg). The remarkable fact is that a few thousand of these molecules when attached to the cell are sufficient to depress its activity."

My data could have been expressed in a different way: 1 grain (originally defined as the weight of a grain of wheat) would suffice to lower the blood-pressure of more than a thousand million cats; yet this dose might not kill a single cat. Clark also calls attention to the work of Loewi which indicates that stimulation of the vagus liberates acetyl-choline around the heart cells and in this way slows or weakens the heart. I had found indications of the presence in the adrenal glands of compounds which were far more active than choline and which seemed to yield choline on chemical treatment; this observation led me to prepare acetyl-choline and so to the discovery of the remarkable physiological activity of this compound. Recently Dale and Dudley have succeeded in isolating acetyl-choline from the spleen, and Kapfhammer and Bischoff believe that they have found it in ox blood.

Dale and Richards found that histamine, a compound widely distributed in animals, is active in even smaller doses than is acetyl-choline.

Clark also calls attention to a number of other very active "drugs" (thyroxin, epinephrine and secretin) which are formed in the body and concludes, "Modern investigations show, therefore, that there is a complex system of control of the body by means of the release of drugs."

The possibilities of finding drugs useful in the treatment of diseases by the pursuit of such studies are obviously very great, but at present very little scientific work is being done along these lines. Ehrlich more than thirty years ago reproached the medical profession and those responsible for the direction of medical research for abandoning to chemists and commercial interests research in this field which he termed the "ureigenstes Gebiet" of the medical profession.

REID HUNT

HARVARD MEDICAL SCHOOL

[1] *Jl. Soc. Chem. Ind.*, June 27, 1930.

SALINITY AND SIZE

IN the *American Naturalist* for March–April, 1930, Federighi[1] notes the smaller size of *Urosalpinx cinerea* from the saline waters at Beaufort, North Carolina, as compared with snails of this species from the less saline waters at Norfolk, Virginia, and he refers to observations by Vernon,[2] Flattely and Walton[3] and Hubbs upon the effects of salinity upon size. Hubbs noted that "within certain limits, size is directly proportional to the salinity," while Vernon and Flattely and Walton "maintain that the more saline waters tend to restrict the size attained."

It may be of interest to note that in a little paper[4] I published in 1904 I described dwarf specimens of *Neritina virginea* in the very salt shore ponds near Port Henderson, Jamaica, West Indies, and similar dwarfs from the almost fresh water in the mouths of two rivers on the northern side of the same island.

[1] Federighi, "Salinity and the Size of *Urosalpinx cinerea* Say," *American Naturalist*, March–April, 1930.

[2] Vernon, "Variation in Animals and Plants," Henry Holt, 1903.

[3] Flattely and Walton, "The Biology of the Sea Shore," Macmillan, 1923.

[4] Metcalf, "*Neritina virginea* variety *minor*," *American Naturalist*, 38, 1904.