vertisement featuring Steinmetz. It was an appropriate gesture; few men have contributed more to G.E.—and not many have done more for the United States. But the advertisement did not note that Steinmetz would not be eligible for employment at G.E. today, would not even be admitted to the United States; he was an avowed Marxist. One cannot help wondering which culture pattern has the greatest survival value: a capitalism so self-confident that it finds even its severest critics a source of strength, or one so timid that it rejects the help of even its best friends.

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14 March 1955.

Status Emeritus

Status emeritus is becoming a well-known clinical syndrome; it develops at all levels of postacademic and professional life. The psychosomatic impact of retirement is becoming an increasing problem; it is one of the by-product phenomena of an aging population. It has long been recognized in the business and commercial-industrial world where many successful procedures have been adopted to smooth the adjustments of transfer. The pension period of labor and management is becoming less dedicated to the barrenness and futility of senescence. Little consideration has been given, however, to the retirement problems associated with the scientist and those specializing in the various fields of medicine where research may be and frequently is the *vis a tergo* of life itself. Recent communications by A. Silverman [*Science* **120**, 278 (1954)] and H. S. Conrad [*Science* **120**, 581 (1954)] point up the economic and scientific problems, but little emphasis is given to the psychosomatic implications of forced professional retirement.

In clinical medicine it has long been known that the chief hazard in prolonged convalescence from any disabling disease is the psychological deterioration that invariably develops; indeed, this profound depressive mood may outlast the original physical syndrome by many months and sometimes years. In certain instances the psychosomatic impact may result in greater scarring than the initial disease process. This is particularly true among individuals primarily engaged in the creative arts, science, and research medicine; strangely enough, in the world of sports where it might be expected that physical disability would produce considerable psychosomatic impact, there appears to be less reaction. Forced academic retirement at the age of 65 (some institutions retire their operating surgeons at 62) finds many medical men at the very peak of their professional careers; although *status emeritus* carries certain consulting privileges in hospitals and medical schools, the abrupt transition from a very exciting and active type of existence to one of relative boredom presents a critical period for most physicians. Loss of intimate contact with younger individuals, the absence of a teaching stimulus, the disappearance of the prestige factor—all produce an emotiopsychic reaction similar to that seen as a developmental part of physical disability, perhaps to a greater degree.

Although this situation has been more or less imperfectly understood for several decades, there has been a startling increase in the number of retirement psychosomatic casualties since World War II. Many suggestions have been made to ameliorate this problem; Conrad, for example, speaks of the creation and appointment of visiting professors of research while Silverman proposes an "Emeritus House." In 1951, the Valley Forge Heart Institute and Research Center in Pennsylvania started a preliminary program for retired research scientists and physicians.

A practical approach to the problem, insofar as it touches the lives of retired physicians and surgeons, has been initiated by the Caroline Greenwood Fund for Medical Research [*N. Y. Physician* **42**, 10 (1954)]. At the 1953 annual meeting of the fund council, a publishing project to be known as "Medicine Emeritus" was organized. I have had the honor of being appointed editor in chief and will have the assistance of eight associate editors representing the various specialties. An attempt is being made to utilize the experience and know-how of a selected group of specialists now retired from active practice in a series of publications. The pilot test will be issued as *Medicine Emeritus Yearbook of 1955*, and it will contain articles on the management of chronic disabling diseases of the heart, kidneys, lungs, and gastrointestinal tract, as well as articles on arthritis, diabetes, and certain eye conditions associated with the aging process.

Although this publication will be a cooperative economic venture, its greatest contribution to the less happy aspects of *status emeritus* will be the prophylactic outlet of the psychosomatic impact of retirement. If the project is successful, it might well point the way toward similar ventures in the fields of pure science, biology, and chemistry. As an experiment in applied sociology, it warrants the attention of all scientists regardless of their present interests. As the sands of time run out, we all approach the line marked *emeritus*.

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1 November 1954.

Thorium Determinations in Manganese Nodules

A knowledge of the geochemical behavior of thorium isotopes in the sedimentary cycle is a prerequisite in using the ionium decay scheme for the measurement of the rates of accumulation of deep-sea sediments. Inasmuch as manganese nodules may reflect mainly hydrogenous precipitation processes (*1*), it was felt of interest to measure their thorium content. Previously, Matthews (*2*) reported evidence for the enrichment

Table 1. The thorium contents of manganese nodules from the Pacific Ocean.

Nodule	Latitude	Longitude	Depth (fathoms)	Thorium (ppm)
Horizon nodule	40°14′N	155°05′W	2790	124 ± 15
Cape Johnson Gyot	17°10′N	177°10′W	1055–1120	24 ± 5
Gulf of Alaska, sample 3	56°10′N	145°15′W		25 ± 2
Hess Guyot (manganese coatings on coquina shells of *Vermicularia*)	17°54′N	174°16′W	956–80	30 ± 6

of thorium in manganese nodules with respect to pelagic clays. Thorium in pelagic clays averages 5 ppm (*3*), whereas Matthews reports minimum thorium contents in three nodules of 30 to 40 ppm. Koczy (*4*) had previously observed higher values of thorium in the nodules than in clays with lower absolute values in both cases.

The following method was employed. Complete dissolution of approximately 1 g of the sample is accomplished by HCl-$HClO_4$, followed by a HF dissolution of the silica residue and a sodium carbonate fusion of any remaining solids. Thorium-234 is added to the combined solutions as a tracer for the determination of the yield. The thorium is then coprecipitated with $Fe(OH)_3$ upon addition of gaseous ammonia. The precipitate is dissolved in HF, and lanthanum carrier is added to precipitate LaF_3, which coprecipitates the thorium. This step is repeated to insure a complete separation of thorium from zirconium. The precipitate is dissolved in an aluminum nitrate-nitric acid solution, and the thorium is extracted into mesityl oxide (*5*). The thorium is stripped into water and extracted into a 2-thenoyltrifluoro acetone (TTA)-benzene mixture (*6*). The residue is then taken up in HCl and measured colorimetrically as the "thoron" complex of thorium (*7*).

The yields varied between 50 and 80 percent. Blank values on the reagents were less than 0.1 μg of thorium. The main interference in the colorimetric method comes from zirconium. Spectrographic analyses on the final residue from the TTA-benzene extraction revealed that the zirconium concentrations were below interfering levels.

The analyses of a number of Pacific Ocean manganese nodules are given in Table 1. Thorium is concentrated in manganese nodules by factors exceeding 5 over deep-sea sediments. This elemental enrichment of thorium closely parallels manganese. Such a result is not unexpected, since other elements, probably existing as cations in sea water, such as nickel, copper, and lead, show a similar behavior (*1, 8*). The unusually high thorium content of the Horizon nodule is anomalous. The thorium was not enriched either in the acid-insoluble residue or in the zeolite phases that form the core of the nodule and often accompany the manganese phases.

These preliminary results (*9*) lend support to the ionium-thorium method for the determination of the rates of accumulation of deep-sea sediments (*3*), since one of the major assumptions of this method is that ionium and thorium in the sediments are accumulated from sea water as opposed to volcanic or terrestrial sources.

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H. G. Wells Predicts

H. G. Wells scores again! From *The Fate of Man* (Longmans, Green, New York, 1939), p. 13:

> It is conceivable that the scientific worker is even now walking into a net; that increasing areas of his inquiries and experiments are falling under the restrictions of "official secrets" and that far beyond the more obvious realms of physics and chemistry, fields of investigation having no direct bearing upon warfare are likely to come under control.

We ain't seen nothin' yet!

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14 March 1955.