4, 5 and 6. The Wisconsin Alumni Research Foundation has made available the necessary funds to finance this institute. Among those who will take part are Dr. L. J. Witts, professor of chemical medicine at the University of Oxford, and Dr. E. Meulengracht, professor of chemical medicine at Copenhagen. The subjects to be discussed include various forms of anemia and the therapy of anemia; the etiology and therapy of granulocytopenia; the formation of hemoglobin; hemorrhagic diseases; leukemia; diseases affecting lymph nodes.

THE name of the Eugenics Record Office, at Cold Spring Harbor, Long Island, N. Y., has been changed to Genetics Record Office. This office is associated with the Department of Genetics of the Carnegie Institution of Washington.

THE chairman of the Board of Agriculture of Bermuda, Sir Stanley Spruling, has outlined the results of an emergency survey recently completed by the Department of Agriculture. Cultivated and uncultivated lands of Bermuda have been surveyed as to crop potentialities and employment in the event of war. The whole plan would not go into operation immediately on the outbreak of war unless the tourist trade, the mainstay of business in the island, had declined seriously. It was stated that an agricultural survey by experts from Cornell University might be undertaken.

MANY bird-watchers in the British Isles, according to the London *Times*, have collaborated in field work under the British Trust for Ornithology, of which the fourth report has been issued. More than one hundred observers recorded day by day the exact song-periods of the misselthrush, songthrush, blackbird, chaffinch, yellowhammer and skylark. This inquiry was continued until recently, because of the abnormal weather of last winter and spring, which caused a scarcity of winter song. More than 150 heronries in 64 counties of the British Isles were visited last year by trust observers, who found that the breeding stock of herons is about at the level of ten years ago, although one Kent heronry had reached a size never before recorded since a systematic census work on this species began in Great Britain. For the little owl inquiry 73 helpers sent material from 34 counties, apart from a large number who sent notes but no material. The national bird-marking scheme was taken over by the trust last year, when more than 45,000 wild birds were marked with rings in the British Isles. Among interesting results of this work were the finding of a rook aged twelve and a blue tit aged at least eight which is still flourishing.

SIR BUCKSTON BROWNE, retired surgeon, donor and honorary curator of Down House, Kent, which was for forty years the home of Darwin, has written the following letter to the London *Times:* "Sir Charles Lyell's second edition of his 'Elements of Geology' appeared in 1841. He annotated a copy in view of another edition, and on the fly-leaf, under 'Addenda,' in his own hand, the following entry appears—'Darwin recommends a short chap. on metallic veins, giving the present state of our knowledge. He denies seeing a beginning to each crop of species. Jan. 26, 1842.' Mrs. Lyell, Sir Charles' sister-in-law, afterwards gave the book to the late Mr. Benjamin Harrison, the celebrated, self-taught, village geologist. It is now in the possession of Mr. Sidney Spokes, M.R.C.S., of Lewes, and will be presented to Darwin's old home, Down House, Downe, Kent, now preserved as a national memorial. This precious little bit of manuscript shows that in 1842 Darwin had fully realized his 'Origin of Species.' He was, however, so patient, so conscientious, in his search for truth that 17 years were to pass before, in 1859, the immortal book appeared."

DISCUSSION

COMPOUND WORDS

IN the current issue of SCIENCE, just received, Dr. H. J. Conn presents an interesting discussion[1] of the confusion occasioned by the orthodox use (and nonuse) of hyphens in the making of multiple compound words. The examples are well chosen from biological terms; but the biologists have no monopoly on such hyphenated chaos. The current issue of *Economic Geology* presents a very instructive example.

An article by E. C. Dapples[2] is entitled: "Coal Metamorphism in the Anthracite-Crested Butte Quadrangles, Colorado." To any one familiar with the region, it is quite obvious that the territory under discussion comprises two adjacent areas, designated respectively as the Anthracite Quadrangle, and the Crested Butte Quadrangle; to others, the connective implication of the hyphen, as used, suggests a butte crested with anthracite. Evidently the "others" include the headline writer for the journal in question; for, in compressing the title to a page heading, he eliminates the pseudo-adjective "anthracite-crested," and has, as a condensed title at the top of fourteen pages, the amazing and amusing contraction: "Coal Metamorphism in Butte Quadrangles." Any geologist will at once connect the term "Butte Quadrangles" with an area in Montana, in which no coal occurs.

In the closing paragraph of his discussion, Dr.

[1] H. J. Conn, SCIENCE, 89: 582–3, 1939.
[2] *Economic Geology*, 34: 4, 369–398, June–July, 1939.

Conn expresses the hope that some system may be devised "to show which elements belong most closely together and which are related to the others more indirectly." His wording here is excellent, and clearly expresses the crux of the problem. It appears that originally the hyphen was used rather freely as a connective; later practise has tended to eliminate the hyphen in compound nouns, except in connecting words of strictly coordinate import. This rule works well for simple or singly compounded words; but with multiple compounds, we need a connective factor for the units of the simple compounds and a separative factor for the compound units of the larger and more complex terms.

In the examples that Dr. Conn cites, it appears that the omission of the hyphen (according to standard practise) suggests a separation of the words in the unit-compounds, while the use of the hyphen between the unit-compound elements appears to tie together those factors that should be separated. Perhaps this seems as pedantic as the question whether the primary function of the mortar in a wall is to hold the bricks together or to hold the bricks apart (I once saw two tipsy brick-masons stage a fight to settle that problem!); but I think it contains the key to the solution of our difficulty.

If the connective implication of the hyphen is so strong as to be confusing, what might we use as a separative factor? May I suggest the disused colon? The colon has gone almost out of fashion in present-day writing; but the mathematicians still use it in their formulas to express a definite comparative relationship. Why may we not do the same in technical writing?

The suggested use of the colon as a separator and the hyphen as a connector is as simple as it is unorthodox. It includes only two rules, which are: (1) In multiple compound words, the single terms of each compound unit are to be connected by a hyphen (whether or not the hyphen would be so used if the unit term stood alone). (2) The compound units are to be separated by colons.

Using Dr. Conn's terrifying examples, they would be expressed as "safranin: orange-G: crystal-violet technic," and as "iron-alum: hematoxylin-phenol: Bismarck-brown Y schedule" (or perhaps "Bismarck: brown-Y schedule"; I am afraid that I shall have to ask Dr. Conn to interpret that one).

The sole merit of such a system is that it makes the meaning of a multiple compound term entirely clear. I have used it repeatedly in class discussions, and it has proved quite adequate, at least in blackboard work.

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THE recent discussion on compound words by Weatherby[1] and Conn[2] presented two interestingly different points of view. The former treated the question without even mentioning that admirable if ancient device, the hyphen, although the heading of his communication, "Compound Words in *Present-day* English," embodied the principle that he failed to invoke. One wonders whether the "mental epidemic" of compounding which he foretells (giving as a sample, "Costanalysis of Scholarlyperiodicalprinting") will not have been started, not by the Greeks and the Germans, but by the author of "Ulysses" and "Finnegan's Wake"? (On the first page of the latter occurs the curious portmanteau "upturnpikepointandplace" —just for example.)

Conn's entertaining picture of the endless editorial battle of the hyphen added details that had seemingly been overlooked by Weatherby. Single-word compounds (*e.g.,* blackbird) are likely to have hyphened compounds (black-bird) as their forerunners; and as Fowler[3] says, "The conversion of a hyphened word into an unhyphened single one is desirable as soon as the novelty of the combination has worn off, if there are no obstacles in the way of awkward spelling, obscurity, or the like." But often there are such obstacles. And that same indispensable mentor, *ibidem,* offers something like the "rules," for hyphening "double-barrelled adjectives," that Conn (and perhaps all of us) cannot find in our grammar-books:

> Mr. Lloyd George (without a hyphen) forms the Lloyd-George Government (with one); the need [for hyphens] is still greater when further complications come, but the result is then unsatisfactory—the Lloyd-George-Winston-Churchill Government. Obviously connexions of a different power are needed; a short & a long hyphen (-, –), or a single & a double one (–, =), would do (the Lloyd-George—Winston-Churchill Government, the Lloyd-George= Winston-Churchill G.); but this is an innovation that would hardly find acceptance; & is better than — or = (the Lloyd-George & Winston-Churchill G.); better than either is some evasion, the George-Churchill G., or the G. of Messrs. Lloyd George & Churchill.

Their unfamiliarity aside, there might still be some (rather remote) possibility of confusing the "long" hyphen with the dash, the "double" hyphen with the "equals" sign. (These objections could be disposed of —except perhaps among the typographical profession —by setting the new symbol slightly above or slightly below the center of the line of type.) Is it not more likely that the "real" reason why such devices would not be generally acceptable is merely that it will always

[1] C. A. Weatherby, SCIENCE, 89: 413, 1939.
[2] H. J. Conn, SCIENCE, 89: 582, 1939.
[3] H. W. Fowler, "A Dictionary of Modern English Usage," Clarendon Press, p. 244.

be easier not to seek precision—not to "bother," even about "short" and "single" hyphens? And yet, as any reader of these musings who knows the work of Korzybski[4] will already have reminded himself, "Hyphens allow us in principle to make compound words structurally similar to the non-elementalistic world we happen to live in."

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WEATHERBY in a recent note[1] says that "The English language is rapidly acquiring a facility in forming compound words comparable to that possessed by ancient Greek and contemporary German." It should not be difficult to convince writers who wish to be understood that they might follow better models than classical Greek, which has now become a "dead" language, or modern German, which has never been known especially favorably either for clarity or ease of reading. Moreover, I question whether the language really *is* changing. *Unit modifiers* always have been used, especially by scientists who were poorer writers than researchers. What is now happening is that we are losing our critical faculties in writing English; the result is that technical writing is full of errors that any one well grounded in the proper use of English would notice immediately. Weatherby cites a few examples of "present-day" English to prove that the language is changing; he is merely proving that it is possible to write poorly and "get away" with it. For instance, he says that thirty years ago no one would have put forth such a title as 'Cost Analysis of Scholarly Periodical Printing." It is still true that no one would write such a title if he hoped to be understood perfectly. Does that title mean, as Weatherby suggests, "An Analysis of the Cost of Printing Scholarly Periodicals?" Perhaps so, but rather it seems to mean "An Analysis of the Cost of Printing Periodicals Scholarly" —a cost (one feels sure after reading much of the current scientific balderdash) that would be much more than that of printing scholarly periodicals. Maybe Mr. Weatherby is right, and in the somedaydistantfuture we shall all be compoundedlyunitmodifying, but if this mentalepidemicurge he speaks of ever truly possesses us, Heaven help our desiringtounderstandusreaders.

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[4] A. Korzybski, "Science and Sanity," Science Press Printing Company, pp. 31, 243; "General Semantics," Arrow Editions, p. 34.

[1] SCIENCE, May 5, 1939, p. 413.

GRANTED that at best hyphenation is a bothersome subject, your correspondent, H. J. Conn, editor of *Stain Technology,* does not seem to be aware of two common rules which simplify the matter somewhat. One is the rule followed by the Chicago University Press and many other people: "Hyphenate adjectival phrases formed of two or more words when preceding the nouns modified, where ambiguity might result." Mr. Conn's phrase "safranin-orange G-crystal violet technic" would become "safranin orange-G crystal-violet technic." The other rule from the same source: "Where one of the components of a compound adjective contains more than one word, an en dash should be used in place of a hyphen." This would make "the Great Northern–Northern Pacific railway system" a manageable term and could be applied also to the "safranin" phrase if preferred.

Mr. Conn has further complicated his problem by not having discovered that the current unabridged Webster (1935) omits the hyphen after non- as a prefix and has made one word of "sporeformer." "Nonsporeformer" is a good example of the very trend Mr. Conn has been desiring.

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THE TECHNOLOGY REVIEW

VALUE OF CHARACTERS OF THE UNDEVELOPED SHOOT IN IDENTIFYING PLANTS

IN many cases foresters and range workers find they must identify woody plants such as forest trees or shrubs in winter condition. In range surveys or quadrat studies it often becomes necessary to ascertain the name of a grass in the early season before the appearance of the inflorescence. Various keys and description are available for this purpose, but very often a positive specific identification can not be made, due to the very nature of the material. Where the plant can be studied again later in the season, this difficulty is not serious. Often this later check can not be carried out. It is the purpose of this article to call attention to the characters of the undeveloped shoot as an aid to the immediate identification of such material.

The leaves and flowers inside the winter buds of woody plants can be so studied. In grasses information gained by dissecting out the small inflorescence which lies in the sheath tube about at ground level may allow for a more definite determination.

The technique of this dissection is not intricate. In woody plants the bud scales can be removed and the shoot exposed for study. In order to have both hands