largely a reflection of the amount of C substance in the vaccines. Standard vaccines subjected to the acid-heat extraction procedure yield extracts which give strong reactions with both type-specific and group-specific antisera. On the other hand, glow bead vaccines similarly treated yield extracts which give strong type-specific reactions but weak or negative group reactions. Furthermore, if samples of the supernatant fluids (discarded in the preparation of the vaccines) are tested with standard Group A antiserum, they give strongly positive reactions, indicating that these supernates contain large amounts of C substance.

It appears that the disruption of the streptococcus cells and subsequent differential centrifugation serve to separate most of the group-specific C carbohydrate from the type-specific M protein. At the same time sufficient cellular material is retained in the sediment to render the M protein antigenic.

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Sulfhydryl and Disulfide in Keratinization[1]

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The common concept of sulfur metabolism in epidermal keratinization has been that the sulfhydryl groups of the Malpighian layer are converted to the disulfide bridges of the keratin molecule (*1–4*). This concept, based largely on histochemical evidence, is not fully supported by evidence derived from modern histochemical sulfhydryl reagents (*5, 6*). Direct chemical determinations of —SH and —S—S— in cutaneous structures are fragmentary, a circumstance which prompted the present study.

Sulfhydryl in ether-washed powdered tissues was measured with the specific Bennett reagent (*7*) after incubating the tissues in water for 1 hr at 40° C or in a 10% solution of Duponol (sodium lauryl sulfate) for 10 min in a boiling water bath. The increase of reactive —SH groups by the latter treatment is not due to splitting of —S—S— linkages inasmuch as: prolonged identical treatment of cystine or insulin yielded no —SH groups; keratin pretreated with iodoacetate, washed repeatedly with water, and then incubated with Duponol, yielded no —SH groups; lithium bromide, a hydrogen bond breaker (*8*), had the same effect as Duponol of increasing the —SH values of keratin.

Disulfide was estimated after conversion to sulfhydryl by incubating the tissues in a boiling water bath with 2 *M* KCN in 0.1 *N* NaOH. With this procedure, the disulfide values of insulin (*9*) and of various horny structures (*10*) were in agreement with data of previous investigators.

Human epidermis was isolated from surgical and autopsy specimens by the stretch method (*11*). Frozen plantar skin was cut into successive horizontal sections 50–75 μ thick; a portion of each section was examined microscopically to determine its histologic nature.

TABLE 1. Sulfhydryl and disulfide content of various skin structures.*

Tissue	Aqueous —SH†	Duponol —SH‡	% Sulfur as —S—S—	% Sulfur as —SH + —S—S—
Man				
Hair	6	11	5.7	5.7
Nails	9	146	3.41	3.46
Plantar calluses	14	49	0.342	0.358
Cow				
Hoof (lateral)	67	230	5.4	5.5
Hoof (plantar)	11	34	2.20	2.21
Hoof (Malpighian layer)	—	57	0.360	0.378
Horn (deep layers)	—	229	4.09	4.16
Horn (surface layers)	41	112	1.67	1.71
Horse				
Burr (horny layer)	9	82	0.305	0.331
Burr (Malpighian layer)	224	590	0.098	0.287

* Sulfhydryl expressed as mM × 10^{-2}/100 g dry weight tissue.
† Values obtained after incubating tissues in water for 1 hr at 40° C.
‡ Values obtained after incubating in 10% Duponol for 10 min in a boiling water bath.

TABLE 2. Sulfhydryl and disulfide content of human skin.*

Tissue	Aqueous —SH†	Duponol —SH‡	% Sulfur as —S—S—	% Sulfur as —SH + —S—S—
Total plantar epidermis	25	88	0.341	0.369
Layers of plantar skin:				
Keratin	13.5	51	0.334	0.345
Keratin	24.5	65	0.323	0.343
Keratin + Malpighian layer	26	115	0.353	0.390
Malpighian layer + small amt. keratin	49	153	0.361	0.410
Malpighian layer + small amt. corium	—	305	0.317	0.415
Corium	0	7	0.033	0.035

* Sulfhydryl expressed as mM × 10^{-2}/100 g dry weight tissue.
† Values obtained after incubating tissues in water for 1 hr at 40° C.
‡ Values obtained after incubating in 10% Duponol for 10 min in a boiling water bath.

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The —SH and —S—S— values are listed in Tables 1 and 2. From these data the following conclusions may be drawn: (1) Significant amounts of —SH were found in all horny structures studied. (2) The rigid chemical distinction between hard and soft keratins on the basis of their sulfur content appears somewhat abitrary. Keratins form a series which contains transitional types. An example of such a transitional type is that found in the horse burr, heretofore considered a prototype of soft keratins. The horse burr is phylogenetically a rudimentary hoof, its keratinization differs histologically from epidermal keratin formation and chemically it resembles hard keratins by virtue of its horny layer having a higher disulfide content than its Malpighian layer. (3) The disulfide content of the Malpighian layer of the sole is in the same range as in the horny layer. This finding supports the theory that epidermal keratinization[3] starts in the depth of the Malpighian layer (*12*).

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[3] Differences between normal and pathologic human keratinization, confirming and extending Zingsheim's data (*13*) will be reported elsewhere.

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Isolation of *Histoplasma capsulatum* from the Air

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An epidemic of histoplasmosis in a farm family in Kansas following cleaning of an unused chicken house offered an excellent opportunity to sample the air for the presence of this organism. *Histoplasma capsulatum* had been isolated from the debris in the chicken house and from soil just outside. The infection had also been demonstrated in animals.

Another opportunity was provided in western Missouri when a soldier suffered an attack of severe pulmonary histoplasmosis after cleaning a chicken house.

TABLE 1.

Location	Date	Length of sampling time (hr)	Height of sampler opening from floor (ft)	Result
Atchison, Kansas	12–11–52	1.5	5	Neg.
	1–27–53	1.5	5	Neg.
	2–18–53	1.5	5	Neg.
	3–13–53	1.5	5	Neg.
	4–14–53	6.0*	2	Pos.
Beverly, Missouri	10–31–52	1.5	2	Neg.
	7– 8–53	9.0*	2	Neg.
	7– 8–53	4.5	5	Neg.
	7–17–53	8.0*	2	Pos.
	7–17–53	4.0	5	Pos.
	7–23–53	12.0†	2	Neg.
	7–29–53	13.5†	2	Pos.
	8– 6–53	9.0*	2	Pos.

* Combination of 2 simultaneous samples.
† Combination of 3 simultaneous samples.

H. capsulatum had been demonstrated in the debris in this chicken house also.

The atmosphere in these chicken houses was repeatedly sampled with portable Venturi scrubber air samplers (*1, 2*). The samplers were operated at 16 cfm. The plane of the Venturi opening was perpendicular to the ground. The debris on the floor of the chicken houses was not disturbed during the sampling period. The organisms in the distilled water in which the air was washed were collected by using the Goetz Millipore filter and injected into Swiss white mice. Sterile equipment and technique were employed throughout. Five of thirteen samples were shown to contain *H. capsulatum.* Details of the sampling are summarized in Table 1.

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Auxin-florigen Balance in Flowering of Soybean[1]

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Since Dostál and Hosek (*1*) first showed that flowering of plants could be delayed or prevented by growth hormone, or auxin, there has been an increasing feeling that auxin may be antagonistic to the postulated flowering hormone, or florigen. Bonner and Thurlow (*2*), Galston (*3*), and Leopold and Thimann (*4*) have observed tendencies toward flowering in plants held on noninductive photoperiods and treated

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