

HIAWATHA'S LIPID

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Americans seem to follow their Puritan ancestors in thinking it proper to follow pleasure by pain; hence the after-dinner speech. When attending the Sixth Annual Symposium on Lipids in San Francisco February, 1958, invited by Dr. Larry Kinsell and my travel made possible by Mr. Alex Poniatoff of the Ampex Corporation, I was told on arrival for the symposium banquet that I would have to reply for the guests. Fortunately I had fortified myself with several martinis for the trek downtown from that neo-colonial edifice, the Hotel Claremont, to Sprenger's Fish Restaurant; on arrival I sought inspiration in innumerable manhattans—taken, of course, because they were good for me since the day's immobility of listening to papers on atheroma and serum cholesterol had no doubt silted up my vessels, and alcohol is one of the few effective solvents. From it "Hiawatha's Lipid" crystallized out.

Though intelligible only to others present at the day's session and banquet, it is given wider publicity than any after-dinner speech should have merely because those at the banquet who were too somnolent to hear it asked to see it so that they might know whether it was as bad as they supposed. There is no glossary, and perhaps explanation is needed that (a) a "quokka" is a marsupial (that is, it carries its nipples in a bag) which has a ruminant's digestion like a cow (which doesn't); (b) "UFA" stands for "Unesterified Fatty Acids" in those parts of the United States that do not call them "NEFA" or "Non-Esterified Fatty Acids" (these symbols also stand for "Unsaturated Fatty Acids" and "Non-Essential Fatty Acids," but the initiated always know what they are talking about).

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From his briefcase Hiawatha
 Took his paper for the meeting,
 Typed in triple-spacing and in
 Triplicate on foolscap paper;
 Glanced upon the crowd before him,
 Critical and very hostile,
 Like the lions in the arena
 Waiting for a Christian victim,
 As the surgeons in some theater
 Wait impatiently the patient;
 Saw them with their notebooks waiting,
 Saw the tape recorder ready
 Gleaming in its chromium plating
 By the Ampex Corporation
 And preserving all the nonsense
 Spoken by the previous speakers,
 As the snow upon the prairies
 Uselessly records the footprints,
 So preserving all the nonsense
 Spoken by the previous speakers.

Introduction

Hiawatha, taking courage,
 Started on the Introduction,
 Giving first a brief description
 Of the Proto-Keysian period
 When all fats in equal measure
 Raised cholesterol in serum:
 Butter, sardines, walrus liver,
 Margarine, or safflower seed oil,
 Or arachidonic acid,
 Or the body fat of quokkas,
 Or adrenals of the muskrat,
 Or the milk of female reindeer—
 As these fats in equal measure
 Raise cholesterol in serum,
 As the rain in San Francisco
 Fills the ditches in the roadways
 (So at least thought Hiawatha)
 So these fats in equal measure
 Raise cholesterol in serum.

Then the Meso-Keysian period
 When it's known from work of others
 Quantitative variations
 Do occur when different lipids
 Are included in our diets,
 Plentifully in our diets:
 Butter, sardines, walrus liver,
 Margarine, or safflower seed oil,
 Or arachidonic acid,
 Or the body fat of quokkas,
 Or adrenals of the muskrat,
 Or the milk of female reindeer—
 Do not in an equal measure
 Raise cholesterol in serum;
 As the smoke is wind-swept upward
 Randomly with Brownian movement
 Wandering above the wigwam,
 So these fats in different measure
 Raise cholesterol in serum.

Then the Neo-Keysian period
 When arithmetic will tell us
 By an intricate equation
 What cholesterol in serum
 We will have when we have eaten
 (And don't vomit having eaten)
 Butter, sardines, walrus liver,
 Margarine, or safflower seed oil,
 Or arachidonic acid,
 Or the body fat of quokkas,
 Or adrenals of the muskrat,
 Or the milk of female reindeer;
 Count the double bonds and add by
 Electronic automation
 On a digital computer
 From the Ampex Corporation.
 There's no need to estimate it—
 All cholesterol in serum
 Follows now the Keys equation;
 As the caribou in summer
 Migrate by accustomed pathways

And predictably are herded,
 Dietetic computation
 Of the double bonds in lipids
 With a slide-rule calculation
 Gives you now a neat prognosis
 Whether you will die tomorrow
 From a thrombus in your vessels—
 Myocardial infarction
 Or ischaemic heart diseases—
 As a cork pushed in a bottle
 Stops the wine from flowing freely
 (Vin rosé of California);
 Atheromatosis also
 Is predicted by this method,
 By this skilful Keysian method.

Others are not quite so lucky:
 Larry's lowered lipid levels (1)
 After vegetable seed oils—
 Polyethenoic acids
 Or essential fatty acids
 From the vegetable seed oils—
 Follow a more simple pattern,
 So at least thought Hiawatha
 In unpublished observations:
 As the sun comes up in morning,
 As the sun goes down in evening,
 So the laws of lipid levels
 Are predictably determined—
 Saturated fatty acids
 Raise cholesterol in serum,
 Polyethenoic acids
 Lower serum lipid levels—
 So at least thought Hiawatha
 In unpublished observations.

Methodology

After this review of others
 Hiawatha turned to methods
 (Methodology, he called it
 Making it more scientific—
 Longer words are scientific);
 Talked about silicic acid,
 Mead's silicic acid column,

How he trapped the different lipids
 As he used to trap the beaver.
 Then he pushed them back and forward—
 Countercurrent distribution—
 As the frightened hare or reindeer
 Runs at random back and forward.
 Then he boiled them up with potash,
 Alcoholic potash mixture,
 Following the rules established—
 Riemenschneider's "skilful witchcraft"
 So politely called by Mattson
 (Personal communication)—
 As the dinner in the stewpot
 Is boiled up by Minnehaha,
 So he boiled them up with potash
 And the double bonds determined
 Spectrophotometrically.
 Then he used the latest method,
 Gas-chromatographic method
 Introduced by James and Martin
 Showing peaks upon the paper
 Like the Rockies at the sunset,
 Like the mole hills in the prairies.
 Thus he estimated lipids
 And he wondered if it mattered,
 Wondered secretly about it
 With unpublishable wond'rings.

Results

Thus supplied with diverse methods
 Hiawatha took some serum
 From his arm by venipuncture
 And cholesterol determined;
 Why he had no clear conception
 But there's wild enthusiasm
 For cholesterol in serum;
 As the children round the camp fire
 Dance and shout in exultation,
 So there's wild enthusiasm
 For cholesterol in serum:
 Why it rises on infusion
 Of suspended phospholipids
 (Ethanolamine and choline

Joined to phosphaditic acid
With unsaturated acids—
Polyethenoic acids—
Also saturated acids,
From the glycerol projecting
Like the branches of a cactus),
Coming out from unknown tissues—
Red cells, liver, spleen and kidneys,
Atheromatous aortas,
Hepatectomized adrenals;
Why it falls when you have eaten
Polyethenoic acids
Or essential fatty acids.

Thinking that this single value
For the level in his serum
Might not be sufficient data
To establish without question
What the normal value should be,
Hiawatha with his cunning
Took a logarithmic table,
Photographed a page at random
For a lantern slide of figures,
Showed it very confidentially
With his back toward the audience
Talking fast and very softly
At the figures thus projected
Which were very small and many
Like the sands upon the seashore;
And the audience, not hearing
What he spoke toward the blackboard
Very softly, very swiftly
Like the gentle brook in springtime,
Thought him wise and very clever
To have got so many figures
And their standard deviations,
Arithmetical progressions,
Geometrical regressions
And regression coefficients;
Praised his industry, his brilliance,
And applauded his statistics,
For they had not understood him
Nor could read his logarithms.

Having thus established clearly
What the normal value should be,
Hiawatha took a patient
Who had grave thrombotic symptoms,
Used his methods on the serum
(Methodology he called it),
Found a curious lipid in it—
Ante-iso-*trans*-oleic;
Recognized it by the usual
Gas-chromatographic method,
By the humps upon the paper
Like the Rockies at the sunset,
By the bumps upon the paper
Like the mole hills in the prairies,
By a very curious spicule
Like the tower of Hotel Claremont
Coming in a new position
Which unquestionably proved it
Ante-iso-*trans*-oleic;
Called it Hiawatha's UFA
"Hiawathianic acid";
No one else had found this lipid
In the serum of a patient;
Called in Hiawatha's syndrome,
Hiawatha's lipidosis,
But he did not know his patient
Had been bitten by a viper—
Viperus Russelianus—
And in Russell's viper venom
There is but one type of UFA—
Ante-iso-*trans*-oleic,
Hiawathianic acid.

Therapy

So he started quick to treat him;
Gave him safflower oil and corn oil,
Gave him pints and quarts of corn oil,
Gave it by infusion, also
Gave it by inunction, also
Poured it down, *per os*, his pharynx,
(As the beaver in the flood time
Being drowned in swirling waters
Soon becomes a bloated carcass),

Every orifice was needed
For administ'ring the doses
Of essential fatty acids;
But the patient still had in him
Ante-iso-*trans*-oleic,
Hiawathianic acid.

So he tried specific treatment;
Gave some linoleic acid
(Octadecadienoic),
Gave arachidonic acid,
Named you might suppose from peanuts,
But it is not found in peanuts
And is plentiful in spiders,
So perhaps he spelt it wrongly—
So "arachnidonic acid,"
Like arachnoidea mater,
Which, as everyone remembers,
Is the inmost spidery mother
Which ensheaths and wraps the cortex;

But the patient still had in him
Ante-iso-*trans*-oleic,
Hiawathianic acid,
Which had come, if he had known it,
From the Russell's viper venom.

Summary

The moral of this story is then
Take some care when you have eaten
Butter, sardines, walrus liver,
Margarine or safflower seed oil,
Or arachidonic acid,
Or the body fat of quokkas,
Or adrenals of the muskrat,
Or the milk of female reindeer;
To avoid thrombosis don't get
Bitten by a Russell's viper
Which has but one type of UFA—
Ante-iso-*trans*-oleic,
Hiawathianic acid.

REFERENCES

1. L. KINSELL and FRISKEY MICHAELS, BEVERIDGE and BRONTE-STEWART, MALMROS, AHRENS, HIAWATHA; 1953 and after: *Archives of Internal Medicine*, Volume 90, page 11.